MicroVAX Diagnostic Monitor User's Guide

Order Number AA–FM7AD–DN

This manual describes how to use the MicroVAX Diagnostic Monitor, a software package that runs diagnostics on the MicroVAX family of computers.

This manual supersedes the *MicroVAX Diagnostic Monitor User's Guide*, AA–FM7AC–DN.

Operating System: MicroVAX Diagnostic Monitor, Version 4.0 or later

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Preface

This manual describes the MicroVAX Diagnostic Monitor (MDM) and explains how to use it.

Intended Audience

This manual is written for users of MDM, who comprise three groups:

- Customers who have purchased a MicroVAX maintenance kit
- DIGITAL service personnel who troubleshoot MicroVAX systems
- Programmers who develop diagnostic programs to test MicroVAX hardware devices

Document Structure

This manual contains five chapters and four appendixes as follows:

- Chapter 1 gives an overview of MDM software.
- Chapter 2 gives instructions for starting and exiting from MDM.
- Chapter 3 gives instructions for starting, using, and exiting from MDM's menu mode.
- Chapter 4 gives instructions for starting, using, and exiting from MDM's command line mode.
- Chapter 5 gives instructions for starting, using, and exiting from MDM's Ctrl/C Mode.
- Appendix A discusses and gives examples of using command line mode to customize testing.
- Appendix B describes how to identify device-level problems.
- Appendix C tells you how to duplicate MDM diskettes and customize MDM tapes.
- Appendix D provides a table of MDM kernel messages.

Conventions

This book uses the following conventions to indicate how to enter commands from the keyboard:

Ctrl/key	Indicates control keys. For example, Control C is shown as Ctrl/C. Enter Ctrl/C by holding down Ctrl and pressing C.
Enter	Indicates issuing characters from the keyboard and activating them by pressing Return. For example, to enter EXIT, type the letters and press Return.
Italics	Indicate command parameters to be replaced with an appropriate word or number.
KEY	Indicates a key on the keyboard. For example, RETURN is a key.
UPPERCASE characters	Indicate input to be typed exactly as shown.
lowercase characters	Indicate input to be replaced with an appropriate word or phrase. For example, in the following interactive command, type SELECT as shown, but replace device_name with the actual name of a device: `MDM>> SELECT device_name`
Press	Indicates making one keystroke with the specified key.
Red print	Indicates user input.

Associated Documents

The following documents relate to MDM installation and use:

- *MicroVAX Customer Hardware Information* manual corresponding to the tested system
- *MicroVAX Diagnostic Monitor Development Kit Installation Guide* (Order Number AA–MF48A–TN)
- *MicroVAX Diagnostic Monitor Ethernet Server Kit User's Guide* (Order Number AA–FNTAE–DN)
- *MicroVAX Diagnostic Monitor Hard Disk User's Guide* (Order Number AA–FK75A–MN)
- *MicroVAX Diagnostic Monitor Programmer's Guide* (Order Number AA–GLPAB–MN)
- *MicroVAX Diagnostic Monitor Reference Card* (Order Number AV–FMXAB–DN)

- *MicroVAX Diagnostic Monitor Development Release Notes* (Order Number AA–FJ99F–TN)
- *MicroVAX Diagnostic Monitor Release Notes* (Order Number AA–GO3AR–TN)
- *MicroVAX Maintenance Guide* (Order Number EK–O01AA–MG–001)

Memory Restrictions

The MDM release described in this book does not support 1M-byte MDM systems. For such systems, you must use MDM version 2.11. The 1987 edition of the *MicroVAX Diagnostic Monitor User's Guide* (Order Number AA–FM7AB–DN) describes commands governing 1M-byte MDM systems.

MDM requires a minimum of 2M bytes of memory: the monitor takes up 1.5M bytes, and diagnostic programs approximately 350K bytes. Use these figures as a guideline to determine whether or not MDM will run on your system. You can run diagnostics under MDM in a limited memory environment by selectively loading them using MDM's Connect/Ignore Menu. (See Section 3.2.5 or the CONNECT and IGNORE commands.)

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Chapter 1

Introduction to the MicroVAX Diagnostic Monitor

The MicroVAX Diagnostic Monitor (MDM) is a software environment that allows you to test DIGITAL's MicroVAX computer components and peripheral equipment, that is, *devices*.[1]

1.1 MDM Uses

You use MDM to test whether individual devices and the entire system function correctly and, if they do not, to isolate problems to a failing Field Replaceable Unit (FRU). A device's own ROM-based tests verify its hardware as opposed to its operation.

A testable device may be either a DIGITAL-supported device that is attached to the system within standard CSR and vector address ranges or a device that does not comply with DIGITAL-recommended vector addresses but that you have made part of MDM's data base.

MDM is available in two versions:

- A menu-driven *customer version*, which is bundled with every MicroVAX system, allows customers to perform basic functional tests on their system.
- The *service version*, which you use, offers numerous testing capacities not offered by the customer version.

1.2 MDM Users

Field service and certain customers, called *self-maintenance customers*, put MDM to work to perform extensive, customized testing of newly-installed or faulty MicroVAX systems. DIGITAL manufacturing personnel use MDM routinely before shipping systems and peripherals to customers. MDM is part of DIGITAL's automated product testing (APT), which ensures that all devices shipped from DIGITAL manufacturing sites meet rigorous standards.

[1] This includes MicroVAX II and MicroVAX 3xxx systems, but not MicroVAX 2000 systems.

1.3 Usage Modes

You can choose menu selections or issue direct commands to perform MDM test functions. Chapter 3 tells you how to use MDM's Menu Mode and Chapter 4 how to use its Command Line Mode (CLM).

You use MDM Menu Mode to:

- Run quick, general tests of the system and its parts
- View the system configuration and devices
- Run system utilities, such as finding device addresses
- Run service options, such as customizing testing
- Connect and disconnect devices and diagnostics
- Test single devices

You use CLM, which performs all menu-mode functions, to control diagnostic operating conditions, for example, by:

- Controlling error message output
- Setting time limits for test runs
- Setting the number of test runs
- Setting the system clock

You can also direct MDM to perform selected functions while diagnostic programs are running. Chapter 5 discusses this mode of operation.

1.4 Test Organization

MDM's diagnostic tests run in two modes: verify and service.

1.4.1 Verify Mode

Verify-mode tests provide a quick check of device function. These tests never destroy data and require no user interaction. In some cases, these restrictions limit the coverage provided by verify-mode tests.

1.4.2 Service Mode

Service-mode tests are more rigorous. Some destroy data and must be used with caution; they often require that you modify device hardware. If they do, they prompt you to perform the *setup*. The setup procedure involves one of the following steps:

- Placing a device on line or off line
- Installing loopback connectors on communication lines
- Installing scratch media in drives

When a setup is needed, the diagnostic describes the procedure, then waits for you to verify that the setup is complete.

1.5 Test Sections

Verify- and service-mode tests and services are divided into three sections according to their purpose as follows:

- Functional tests
- Exerciser tests
- Utility tests and services

1.5.1 Functional Tests

Functional tests examine each device individually, as though it existed in a stand-alone environment. You run functional tests to obtain complete operational testing of a device and to identify a faulty FRU. Functional tests always tell you whether the device passed or failed and indicate the FRU associated with the failed device.

1.5.2 Exerciser Tests

Exerciser tests examine devices as they interact with other devices. Several tests run at the same time to simulate a busy system with heavy bus activity. You use these tests to identify causes of intermittent system failures.

1.5.3 Utility Tests and Services

Utility tests perform highly specialized testing of individual devices. You run these tests one by one. They frequently require setup before testing begins.

Utility services perform functions not related to diagnostic testing. For example, MDM offers a formatting utility that formats RD5n series fixed disks.

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Chapter 2
Starting and Exiting from MDM

This chapter describes how to:

- Start (load and boot) MDM
- Exit from MDM

2.1 Loading and Booting MDM

You load and boot MDM differently from different media. MDM is distributed on:

- TK50/70 magnetic tape (see Section 2.1.2), including VAXserver 3602 Systems (see Section 2.1.2.3)
- RX33/50 diskettes (Section 2.1.3 describes how to load and boot MDM from diskette)

You may also load MDM into:

- Diskless or tapeless systems (see Section 2.1.4)
- A target system to run diagnostics from the host console (see Section 2.1.5)
- Hard disk or RF-series Integrated Storage Element (ISE) systems (see Section 2.1.6)
- Dual-host systems (see Section 2.1.7)

2.1.1 MDM Autobooting

You can type a command to transfer MDM software from the load media to the system memory (manual booting), or the system can automatically perform the transfer (autobooting):

- If halts are enabled, you must boot MDM manually. You must also boot MDM manually if you have exited from it and wish to reboot it.

The Halt (Break) Enable/Disable switch is a toggle switch located on the back panel of your CPU. The circle inside the dot indicates the enable position.

- If halts are disabled, MDM autoboots, provided it is loaded into the drive that is the first bootable device in the automatic boot sequence.[1]

  The Halt (Break) Enable/Disable switch is a toggle switch located on the back panel of your CPU. The circle outside the dot indicates the disable position.

When MDM autoboots, the system searches for devices from which to transfer MDM to memory in the order shown in Table 2–1. It conducts the search in the order of increasing unit number for a unit with a removable volume. If it finds none, it searches the next controller. If it finds no removable volume, it repeats the search for a nonremovable volume.

Once the system finds a device containing MDM, it loads MDM into memory.

Table 2–1: Automatic Boot Sequence

Controller Type	Controller	Device Name
MSCP (disk)	RQDX	DUmr (RX50 diskette drive)
		DUmr (RD5n fixed disk drive)
	KDA	DJmr (RA60 disk drive)
		DUmr (RA81 disk drive)
MSCP (tape)	TQK50	MUmr (TK50 tape drive)
PROM	MRV11	PRmr (user defined)
Ethernet adapter	DEQNA	XQmr (network)

Device names are 4-character names in the form ABmr, where:

- **AB** represents the controller type
- **m** represents the controller number
- **r** represents the device number

[1] You can do this by removing previous devices (see Table 2–1) containing operating system software or taking them off line.

For example, in "DUA0", DU indicates the device (a disk drive); A indicates that the device is the first device seen by a controller; 0 indicates that the controller sees the drive as the first drive.

2.1.2 TK50/TK70 Instructions

The diagnostic tests run the same way whether or not system software (such as VMS, ULTRIX–32, or VAXELN) has been loaded. You can manually boot the diagnostic software or use the autoboot feature to boot the software automatically. The following sections explain how to boot MDM manually and automatically, and how to boot MDM on VAXserver 3602 systems. Carefully follow the directions for setting switches.

NOTE: *Before running MDM on your TK50 or TK70 tape drive, you may want to reread the tape drive operating instructions found in your system-specific operation manual.*

2.1.2.1 Booting MDM Manually

NOTE: *Before booting MDM on a system with software installed, warn all users to log off; then, perform system shutdown, as described in your system software manuals.*

If your system contains system software:

1. Make sure the Write Protect switch on the tape cartridge is in the Write Protect position.
2. Write protect all disk drives and RF-series ISEs.
3. Move the Break Enable/Disable switch on the CPU panel to enable (up, dot inside the circle).
4. Press the Reset[1] button if the system is running or turn on the system if the system is off.
5. When the green light on the tape drive glows steadily (if you are using a TK70 tape drive, orange and yellow lights go out), insert the tape cartridge containing the MDM software into the tape drive, and lock it into place.

   If you are using a TK50 tape drive, press the Load/Unload button to the load (in) position.

   Result: While you are inserting and loading the tape cartridge, the normal power-on countdown appears on the console terminal. After the countdown, you see the >>> prompt, indicating console mode.

[1] MicroVAX II systems have a Restart button located on the front panel, rather than a Reset button.

6. Use the command BOOT MUA0 to tell your system to load the MDM software from the tape cartridge. Loading the software takes several minutes. An indicator light on the tape drive flashes while loading occurs. (If you are using a TK50 tape drive, a green light flashes; if you are using a TK70 tape drive, a yellow light flashes.) Section 2.1.8 describes the display you see and the steps to perform when loading is completed.

2.1.2.2 Booting MDM Using Autoboot

NOTE: *Before booting MDM on a system with software installed, warn all users to log off; then, perform system shutdown, as described in your system software manuals.*

1. Make sure the Write Protect switch on the tape cartridge is in the Write Protect position.
2. Remove any removable disks and place all fixed-disk drives and RF-series ISEs off line.
3. Write protect all disk drives and RF-series ISEs.
4. Turn off your system.
5. Move the Break Enable/Disable[1] switch on the CPU cover panel to disable (dot outside the circle).
6. Turn on your system.
7. When the green light on the tape drive glows steadily (if you are using a TK70 tape drive, orange and yellow lights go out), insert the tape cartridge containing the MDM software into the tape drive, and lock it in place.

   If you are using a TK50, press the Load/Unload button to the load (in) position.

   Result: While the system loads MDM, the power-on countdown appears on the screen. Loading the software takes several minutes. An indicator light on the tape drive flashes while loading occurs. (If you are using a TK50 tape drive, a green light flashes. If you are using a TK70 tape drive, a yellow light flashes.)

Section 2.1.8 describes the display you see when loading is completed.

[1] MicroVAX II systems have a Halt Enable/Disable switch.

2.1.2.3 Starting MDM from VAXserver 3602 Systems

You must run MDM software differently for each cabinet in the VAXserver 3602 system. To run MDM in the primary cabinet, follow the instructions in either of the two previous sections. To run MDM in the secondary cabinet, you must load the Ethernet server diagnostic software into the primary cabinet and down-line load it to the secondary cabinet.[1]

The Ethernet server diagnostic software is supplied on a tape cartridge. Instructions for down-line loading the software to the secondary cabinet are in the *MicroVAX Diagnostic Monitor Ethernet Server User's Guide* supplied with your system.

Section 2.1.8 describes the display you see and the steps to perform when loading is completed.

2.1.3 Starting MDM from an RX33 or RX50 Diskette

You follow the same instructions for booting MDM from an RX33 or RX50 diskette whether or not system software has been installed on the system.

NOTE: *MDM does not boot from an RX33/50 diskette drive that is not cabled to the first MSCP controller.*

CAUTION: *Before booting MDM on a system with software installed, warn all users to log off; then, perform system shutdown, as described in your system software manuals.*

To run diagnostic software from RX33/50 diskettes, do the following:

1. Make sure the Halt Enable/Disable switch is set to disable (down).
2. Set the fixed disk 0 Ready button on the system control panel to the out position.
3. Insert diskette RX33A or RX50A into one of the drives (be careful to align the orange arrow on the diskette with the orange stripe on the drive) and close the door.
4. Press the Restart button if the system is running, or turn on the system if the system is off.

   Result: A countdown from 7 through 3 appears on the console terminal as the system performs self-tests. The countdown continues from 2 to 0 as the system loads the diagnostic software.

[1] To run MDM in the secondary cabinet, VMS or ULTRIX operating system must be installed in the primary cabinet.

5. MDM may now prompt you to remove diskette RX33/50A and insert the next boot diskette. Remove diskette RX33/50A and insert diskette RX33/50B.

6. Section 2.1.8 describes the display you see and the steps to perform after you have inserted the diskette.

   While MDM is running, it may prompt you to insert additional diskettes. Insert the specified diskettes. If your system does not request all the diskettes containing diagnostic software, your configuration does not need the additional diskettes for testing.

2.1.4 Starting MDM on Diskless and Tapeless Systems

If you have a diskless and tapeless system that is part of a local area network (LAN), you must obtain the MicroVAX Ethernet Server Diagnostics Kit. The kit enables you to install MDM software on a host VMS operating system and down-line load MDM to other systems that are part of the LAN, using the DECnet/Ethernet network facilities.

You can run MDM from that system's terminal, or you can run it from a remote terminal.

MicroVAX Diagnostic Monitor Ethernet Server User's Guide explains how to run MDM from the diskless and tapeless system's console. Section 2.1.5 explains how to run MDM from the host (remote) terminal.

NOTE: *If you have a diskless and tapeless system that is not part of a local area network (LAN), you cannot run MDM. To diagnose problems, call a DIGITAL service representative.*

2.1.5 Starting MDM on a Remote System

This section describes how to use MDM's remote console feature to start MDM on a host (remote) system rather than from the console terminal of the target system. Running remote console requires no special privileges.

Complete the following steps to use a remote console:

1. Install MDM and set up the network database as described in the *MicroVAX Diagnostic Monitor Ethernet Server Kit User's Guide*. The guide also explains how to run MDM in Remote Console Mode.

2. Boot the NA11Ax or NA12Ax image at the target. Use NA11Ax if the target has a DEQNA, DELQA, or DESQA as its Ethernet controller. Use NA12Ax if the target has a KA640 CPU and loads over the LANCE port located on the CPU front panel. The boot process is as follows:

```
>>> BOOT/100 xqa0
2...
Bootfile: NA11Ax.sys
```

For LANCE-loaded devices, type the following command:

```
>>> BOOT/100 esa0
2...
Bootfile: NA12Ax.sys
```

3. Wait until the uVDOS banner appears on the target's screen.
4. Log into an account on the host system; set the default directory to MDM$MAINT.
5. Once the uVDOS banner appears on the target console, type the following command from the host:

   ```
   $ RUN FE$REMOTE
   ```

6. Enter the target node name and any 5-character password when prompted.
7. Section 2.1.8 describes the display you see and the steps to perform when loading is completed.

After the MDM introductory display appears, run MDM the same in Remote Console Mode as from the target console.

CAUTION: *Do not press* Ctrl/C *to stop MDM.* Ctrl/C *terminates the MDM process and returns control to VMS.*

To stop the remote process, enter the following command:

```
$ STOP username_1
```

The variable username refers to the username at login.

2.1.6 Installing MDM on Hard Disk or RF-Series ISE

MDM software can be installed on an RF-series ISE or on an RA/RD-series hard-disk drive using the MDM Hard Disk Kit. See the *MicroVAX Diagnostic Monitor Hard Disk User's Guide* for installation instructions.

Section 2.1.8 describes the display you see and the steps to perform when loading is completed.

When loading is completed, place all RF-series ISEs on line. If the ISEs are not on line, they cannot be tested completely.

NOTE: *The MDM Hard Disk Kit is required for dual-host systems where one host is a tapeless system.*

2.1.7 Running MDM on a Dual-Host System

You perform diagnostics separately for each host. The procedure for running diagnostics differs depending on whether one of the hosts is a tapeless system (no tape drive) or if each host has its own tape drive. Use the instructions in Section 2.1.7.1 to run diagnostics in a dual-host system with one tape drive. Use the instructions in Section 2.1.7.2 to run diagnostics in dual-host systems with a tape drive in each host.

2.1.7.1 Running MDM on a Dual-Host System with One Tape Drive

A dual-host system with one tape drive (one tapeless host) requires the MDM Hard Disk Kit. Complete the "Diagnostic Software Installation Acknowledgment" and install the kit on an RF-series ISE according to the procedure in the *MicroVAX Diagnostic Monitor Hard Disk User's Guide.* When the installation is complete, use the following procedure to run the diagnostics software:

1. Set the Break Enable/Disable switch on both hosts' CPU panels to enable (up, dot inside the circle). Turn on both hosts. If the host are already powered up, press BREAK.

   Result: You see the >>> prompt, indicating console mode on your terminal.

2. Use the command BOOT/100 DIAn (for KA640 CPU-based DSSI) or BOOT/100 DUAn (for KFQSA-based DSSI), where n is the unit number of the disk containing the MDM Hard Disk Kit.

   Result: The system then prompts for the bootfile:

   ```
   Bootfile:
   ```

   Enter the name of the file image: [SYS0.SYSEXE]MDMDIA.SYS for systems with on-board DSSI, or SYS0.SYSEXE]MDM.SYS for systems using the KFQSA storage adapter. Press RETURN to continue booting.

3. Section 2.1.8 describes the display you see and the steps to perform when loading is completed.

4. Run the diagnostics tests, as described in this chapter.

5. When you have completed the tests on the first host, make sure the Break Enable/Disable switch is set to enable (up, dot inside the circle) and press the Reset button on that same host. When the countdown completes and the >>> prompt appears, boot the diagnostics from the

second host using the commands described in steps 2 and 3, and run the diagnostics as you did for the first host.

2.1.7.2 Running MDM on a Dual-Host System with Two Tape Drives

Run diagnostics on dual-host systems with two tape drives according to the following procedure:

NOTE: *You can also use the MDM Hard Disk Kit as described in the previous section.*

1. If software is installed on the system, warn all users to log off; then, perform system shutdown, as described in your system software manuals. Turn off both hosts.
2. Make sure the Write Protect switch on the tape cartridge containing the MDM diagnostics is in the Write Protect position.
3. Set the Break Enable/Disable switch on both hosts' CPU panels to enable (up, dot inside the circle).
4. Turn on both hosts.

   Result: The normal power-on countdown appears on the console terminal. After the countdown, you see the >>> prompt, indicating console mode.
5. Insert the tape cartridge containing the MDM software into the tape drive in one of the host systems and lock it into place. For the same host, use the command BOOT MUA0 to load the MDM software from the tape cartridge.
6. Section 2.1.8 describes the display you see and the steps to perform when loading is completed.
7. Run the diagnostics tests, as described in this chapter.
8. When you have completed the tests on the first host, remove the tape cartridge by following the procedure described in your system-specific operation manual. Press the Reset button on that same host. When the countdown completes and the >>> prompt appears, insert the tape cartridge into the tape drive in the second host, and lock it into place. Use the command BOOT MUA0 to boot the tape, and run the diagnostics as you did for the first host.

2.1.8 MDM Introductory Screens

After the tested system has loaded the MDM operating system, MDM displays its introductory screen and asks you to change the current date and time if necessary.

If the displayed date and time are correct, press Return to continue. If they are incorrect, type the correct date and time, using the format shown in the MDM introductory screen display.

Figure 2–1: MDM Introductory Screen

```
MicroVAX Diagnostic Monitor          Release nnn  Version  Vxx.x

              CONFIDENTIAL DIAGNOSTIC SOFTWARE
           PROPERTY OF
  DIGITAL EQUIPMENT CORPORATION

  Use Authorized Only Pursuant to a Valid Right-to-use License

Copyright (c) 1986, 1988, 1989
Digital Equipment Corporation

The current date and time is:  6-AUG-1989 15:14:57.18

Press the RETURN key to continue,
or enter the new date and time; then press the RETURN key.

      [DD-MMM-YYYY  HH:MM]:
```

MDM displays its mode selection screen and asks you to choose the operating mode in which you will run MDM, as illustrated in Figure 2–2.

Figure 2–2: Mode Selection Screen

```
The current date and time is:  6-AUG-1989 15:15:21.23

 Do you want to use menu mode or command line mode?

  1 - menu mode
  2 - command line mode

 Type the number; then press the RETURN key. >
```

Select the operating mode:

- Press 1 Return to enter Menu Mode. MDM displays its Main Menu, as illustrated in Figure 2–3.

- Press 2 [Return] to enter CLM. MDM prompts you to confirm or refuse this request.
  - If you confirm the request, MDM enters CLM mode and displays the CLM prompt (MDM>>).
  - If you refuse the request, MDM enters menu mode and displays the Main Menu, as illustrated in Figure 2–3.

Figure 2–3: MDM Main Menu

```
MAIN MENU                        Release nnn   Version Vxx.x

1 - Test the system
2 - Display System Configuration and Devices
3 - Display the System Utilities Menu
4 - Display the Services Menu
5 - Display the Connect/Ignore Menu
6 - Select single device tests

Type the number; then press the RETURN key. >
```

2.2 Exiting from MDM

Exit from MDM by doing one of the following:

- Press [Break] .
- Press and then release the Halt button on the operator control panel.
- Press the Reset button.

Remove the diskette or tape cartridge, as explained in your system-specific operation manual.

2.2.1 Installing or Restoring System Software

If you have run MDM on a new system, you are ready to install your system software. Follow the instructions in your system software manuals.

If you have used the Disk Formatter Utility to format a fixed disk or a diskette, you must reinstall system software. Set the Write Protect button to write-enable, and install system software.

If you have run MDM on a system containing system software, you must reboot your system software.

You can reboot your system software in one of two ways:

- At the console mode prompt >>>, use the command BOOT Dxxx, where Dxxx is the device name of the fixed disk or RF-series ISE containing your system software.

  (Use DUxx if this is an RD or RA disk drive or an RF drive attached to a KFQSA; use DIxx if this is an RF drive attached to a DSSI.)

  The system loads its software. After it has loaded the software, set the Break Enable/Disable switch to disable, indicated by the dot outside the circle, to avoid inadvertently halting the system by pressing the Break key.

- Set the Break Enable/Disable switch to disable and press the Reset button. This causes your system to begin the power-on sequence again and automatically load system software.

2.2.2 Exiting from the Remote Console

To exit from remote console, use one of the following methods:

- Press Ctrl/C and log out.
- Press Ctrl/C; then, enter the following command to stop the MDM process:

  ```
  $ STOP username_1
  ```

  The variable username refers to the username at login.

Chapter 3
Menu Mode

You can choose menu selections to perform the following MDM operations:

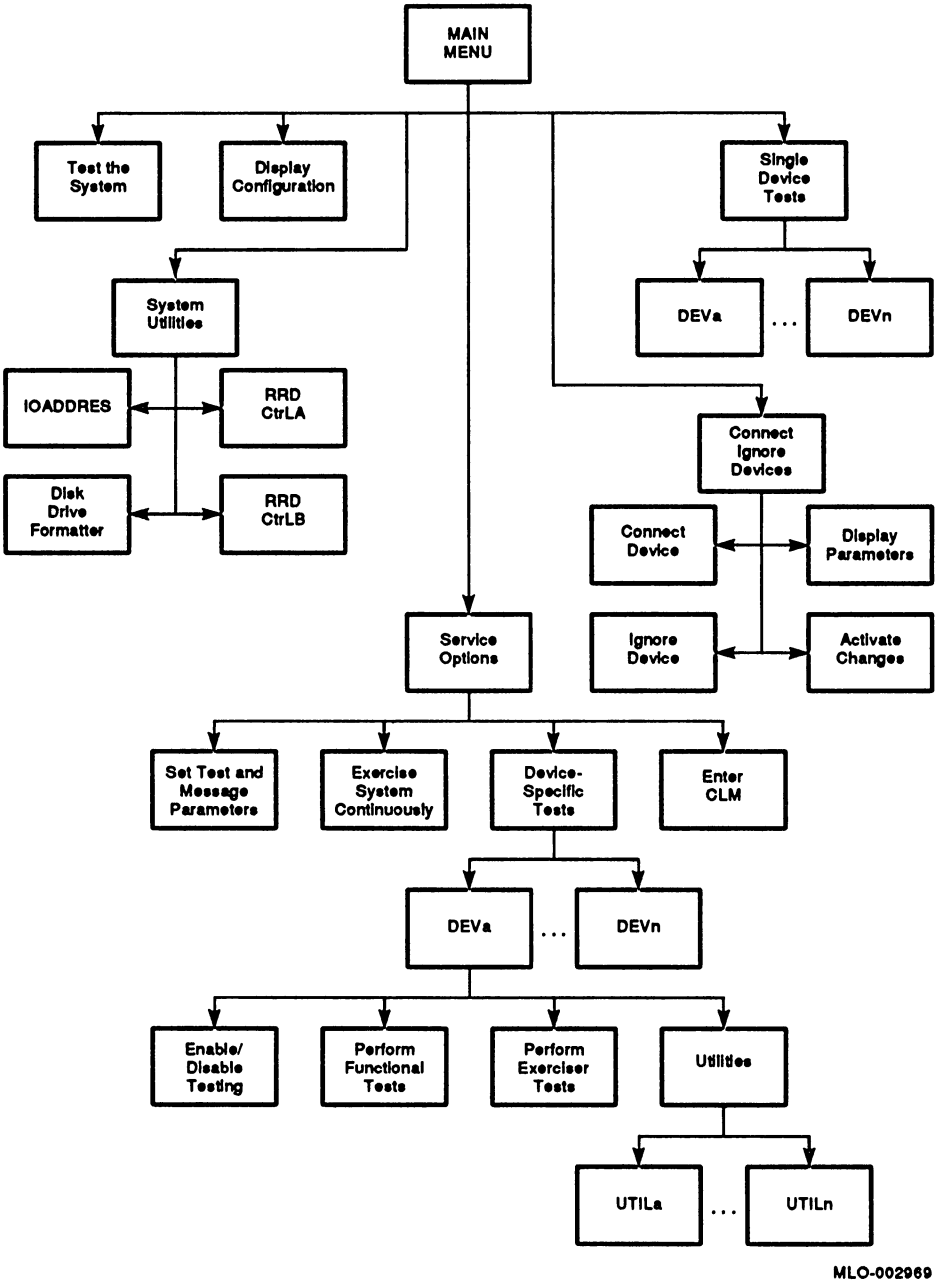
- Testing the entire system (see Section 3.2.1)
- Displaying the system configuration and devices (see Section 3.2.2)
- Running the system utilities (see Section 3.2.3)
- Running service options (see Section 3.2.4)
- Connecting and ignoring devices and diagnostics (see Section 3.2.5)
- Testing single devices (see Section 3.2.6)

Section 3.1 explains how to use MDM menus.

3.1 Using MDM Menus

Figure 3–1 shows a diagram of MDM's menu structure.

Figure 3–1: MDM's Menu Structure



3.1.1 Entering Menu Mode

You enter MDM Menu Mode either at boot time or from Command Line Mode (CLM).

3.1.1.1 Entering Menu Mode at Boot Time

Boot MDM software using one of the procedures outlined in Chapter 1. MDM asks you if you want to enter menu or Command Line Mode. Enter 1 to select Menu Mode, as illustrated by Figure 3–2.

MDM continues loading its software and displays the Main Menu. The Main Menu is illustrated in Figure 3–3.

Figure 3–2: Selecting Menu Mode

```
The current date and time is:  6-AUG-1989 15:15:21.23
 Do you want to use Menu Mode or Command Line Mode?

  1 - Menu Mode
  2 - Command Line Mode

 Type the number; then press the RETURN key. > 1
```

3.1.1.2 Entering Menu Mode from Command Line Mode

To enter Menu Mode from CLM, type the RESTART command. See the following example:

```
MDM>>  RESTART
```

MDM displays the Main Menu. (See Figure 3–3 and Section 4.1.3 for more information about Command Line Mode.)

Figure 3–3: MDM Main Menu

```
MAIN MENU                    Release nnn   Version Vxx.x

1 - Test the system

2 - Display System Configuration and Devices

3 - Display the System Utilities Menu

4 - Display the Services Menu

5 - Display the Connect/Ignore Menu

6 - Select single device tests

Type the number; then press the RETURN key. >
```

3.1.2 Selecting a Menu Option

Each menu option represents an operation that you want MDM to carry out. Enter the number of the option that you want to perform. MDM responds by:

- Carrying out that operation—for example, testing the entire system
- Displaying the choices for that operation—for example, displaying the system utilities you can run.

Figure 3–4 shows how to select a menu option.

Figure 3–4: Selecting Menu Option

```
MAIN  MENU                                Release nnn   Version Vxx.x

1 - Test the system

2 - Display System Configuration and Devices

3 - Display the System Utilities Menu

4 - Display the Services Menu

5 - Display the Connect/Ignore Menu

6 - Select single device tests

Type the number; then press the RETURN key. > 3
```

MDM responds by displaying the System Utilities Menu (see Figure 3–5). If the diagnostics have not been loaded, the system loads them before configuring (that is, identifying and initializing) them, and you must press Return after the configuration is completed.

Figure 3–5: System Utilities Menu

```
MAIN  MENU                              Release nnn   Version Vxx.x
SYSTEM UTILITIES

 Utility selections are:

 1 - IOADDRES
 2 - RXAA - Disk drive formatter for RQDX controller A
 3 - RRAA Update Drive Unit Number for RRD40 Controller A
 4 - RRAB Update Drive Unit Number for RRD40 Controller B

Type the number, then press the RETURN key,
or type 0 and press the RETURN key to return to the Main Menu. >
```

NOTE: *The software for the utilities shown in items 2, 3, and 4 in this menu must be loaded and configured before they can appear in this menu.*

3.1.3 Redisplaying the Previous Menu

At any menu, you can redisplay the previous menu by pressing Return as directed or by entering 0. The name of the previous menu is listed directly above the name of the current menu in the upper left corner.

3.1.4 Redisplaying the Main Menu

At any menu, you can redisplay the Main Menu either by pressing Return as directed, by entering 0, or entering M.

For example, to display the Main Menu from the Select Single Device Tests menu, enter 0. (See Figure 3–6.)

Figure 3–6: Sample List of Devices to Test

```
MAIN MENU                               Release nnn   Version Vxx.x
SELECT SINGLE DEVICE TEST

       1 - CPUA - MicroVAX/rtVAX CPU
       2 - MEMA - MicroVAX II Memory System
       3 - RQDXA - Winchester/diskette controller
       4 - TKXXA - TK50/TK70 CONTROLLER
       5 - DH-CX0A - DHV11 - 8 lines, Modem control
       6 - DEQNAA - Ethernet controller
       7 - Unknown - Diagnostic not loaded.
       8 - No Dg RED - Diagnostic not loaded.
       9 - No Ld JOE - Diagnostic not loaded.

Type the number, then press the RETURN key,
or type 0 and press the RETURN key to return to the Main Menu. > 0
```

MDM displays the Main Menu. (See Figure 3–3.)

3.2 Running MDM Menu Options

The following sections explain how to use MDM Main Menu options to carry out testing functions.

3.2.1 Testing the System

You choose Main Menu option 1, Test the system, to run a quick, general test of the system. The test runs without jeopardizing data and does not require you to intervene manually, for example, for attaching loopback connectors.

You run the Test the system option after you have installed the system or a new device and when you suspect a problem in an installed system. After you choose the Test the system option, diagnostics not already loaded are configured and are displayed as shown in Figure 3–7.

Figure 3–7: Configuring the System

```
Loading diagnostic program for CPUA
Loading diagnostic program for MEMA
Loading diagnostic program for RQDXA
Loading diagnostic program for DEQNAA
Loading diagnostic program for  DZQ11A
Loading diagnostic program for DH-CX0A
Loading diagnostic program for TKXXA
Configuring diagnostic for CPUA
Configuring diagnostic for MEMA
Configuring diagnostic for RQDXA
Configuring diagnostic for DEQNAA
Configuring diagnostic for DZQ11A
Configuring diagnostic for DH-CX0A
Configuring diagnostic for TKXXA
The system is ready for testing.
Press the RETURN key to continue. >
```

Next, the system displays the Test the System Introductory Screen (Figure 3–8) and asks you if you want to begin testing. Press Return to begin testing. If the diagnostics have not been loaded, the system loads them before configuring them; press Return after the configuration is completed.

Figure 3–8: Test the System Introductory Screen

```
MAIN  MENU                                Release nnn  Version Vxx.x
SYSTEM TEST

 This is a test of the MicroVAX computer and its devices.

 No additional preparation for this testing is required;
 the MicroVAX is ready to be tested.

 Testing occurs in two parts: the functional tests quickly
 test each device sequentially; the exerciser test (lasting
 about 4 minutes) tests how the devices work together.

 To halt the test at any time and return to the Main Menu,
 press Ctrl/C by holding down the Ctrl key and pressing the C key.

Press the RETURN key to begin testing,
or type 0 and press the RETURN key to return to the Main Menu.
```

Progress messages are displayed during testing. Figure 3–9 gives an example of a successful Test the System progress message.

Figure 3–9: Test the System Progress Messages

```
BEGIN DEVICE TESTS

 This is a test of all system devices identified by the
 system.  If any of your system devices are not listed
 below, consult your system documentation for the action
 to take.

 Device                  Result

 CPUA ................. passed
 MEMA ................. passed
 RQDXA ................ passed
 DEQNAA ............... passed
 DZQ11A ............... passed
 DH-CX0A .............. passed
 TKXXA ................ passed

BEGIN EXERCISER TEST

 Results are reported at the end of the testing.
SYSTEM TEST PASSED

 All devices passed functional test and the system passed
 the exerciser test.

 At this point you may exit from the MicroVAX Diagnostic Monitor
 or perform more specialized testing. If you would like
 additional information, consult the system documentation.

Press the RETURN key to return to the previous menu. >
```

However, if MDM detects a faulty device, it displays a message that identifies the device and the failing Field Replaceable Unit (FRU) associated with the device. Testing does not continue and you are prompted to press Return. Figure 3–10 shows a sample unsuccessful test message.

Figure 3–10: Sample Failure Message

```
BEGIN FUNCTIONAL TEST

     Device                    Result

     DEQNAA ..................  FAILURE DETECTED

     A failure was detected while testing the

          OPTION: DEQNAA  Ethernet controller

     The Field Replaceable Unit (FRU) identified is the:

          Ethernet controller

Consult your system documentation for the action to take.

Press the RETURN key to return to the previous menu.>
```

Replace or repair the faulty FRU. If the problem persists, run the appropriate device-specific tests. See Section 3.2.4.3 or Appendix A.

The following message may appear after you select the Test the System option of the Main Menu:

```
All devices disabled, no tests run.
```

The message indicates one of the following conditions:

- All system devices are so defective that they are not testable.
- Every device in the system is configured to an invalid address.
- You entered the Connect/Ignore Menu, ignored all devices and activated the Connect/Ignore Menu.

After you read this message, press Return to redisplay the Main Menu.

3.2.2 Displaying the System Configuration and Devices

You choose Main Menu option 2, Display System Configuration and Devices, to find information about all options (components and devices) recognized by MDM. These options may be testable or nontestable.

After you choose the Display System Configuration and Devices option, MDM configures the system by identifying and initializing the diagnostics and loading them if they have not already been loaded. MDM then displays a System Configuration and Devices screen. A sample display screen is shown in Figure 3–11.

Figure 3–11: System Configuration and Devices Screen

```
MAIN  MENU                                Release nnn   Version Vxx.x
SYSTEM CONFIGURATION AND DEVICES

 CPUA ... MicroVAX/rtVAX CPU
     KA630-AA 1MB,  FPU MC=00 HW=00
 MEMA ... MicroVAX II Memory System
     5 megabytes. 10240 Pages.
    KA630 ... M7606-AA/EA CPU module with 1MB on-board memory
    MS630-BB ... M7608-BA (MS630-BB) Memory module, quad height 4mb
 RQDXA ... Winchester/diskette controller.
     Revisions = 2 and 1
    RD53 ... Unit #0, Nonremovable, Write protected
 DEQNAA ... Ethernet controller
     DELQA/DESQA  Q 08-00-2B-03-AC-DF
 DZQ11A ... Asynchronous line controller.
 DH-CX0A ... CXA16/CXB16/CXF32/DHF11 - 16 lines, No Modem control
     ROM Rev: CONTROL = 16 OCTART = 1
 TKXXA ... TK50/TK70 CONTROLLER
     TK-Q_REV MC=4

Press the RETURN key to return to the previous menu. >
```

3.2.2.1 Device Information: Description, Revision Level, Other Information

MDM displays up to two lines of information for each device. The first line lists the name of the device and gives a brief description. If there is a second line, it displays various information, for example, the revision level of the device.

The revision level can refer to hardware, firmware, and/or microcode. This information helps you find out if the hardware, firmware, and software are compatible.

An example of information lines taken from Figure 3–11 is:

```
 CPUA ... MicroVAX/rtVAX CPU
     KA630-AA 1MB,  FPU MC=00 HW=00
```

In this example, CPUA is at microcode revision level 0 (MC=00) and hardware revision level 0 (HW=00). Figure 3–11 displays additional information about specific devices:

- CPU—Type of CPU, amount of memory on the CPU board, and presence of a floating-point unit (FPU)
- MEM—Total amount of memory in megabytes and pages, plus the number and type of memory modules
- RQDX—Type, unit number, and description of each mass storage device connected to the controller

- DELQA/DEQNA/DESQA—Ethernet station address
- Communications devices—Type of device and whether it has modem control

3.2.2.2 Nontestable Devices

A device that is physically present in the system but not described in the System Configuration and Devices display is an untestable device. MDM displays messages indicating the presence of such devices.

For each DIGITAL device present in the system that has not been properly installed or for which a diagnostic is not present on the MDM media, MDM displays a message such as:

```
No Dg
```

For example, the following message indicates that a diagnostic for CPUA does not reside on the MDM media:

```
No Dg KAA ... Diagnostic not loaded
```

For each unrecognized system device, MDM displays the message:

```
Unknown ... Diagnostic not loaded
```

The message may indicate one of the following conditions:

- The device is configured to a nonstandard Control and Status Register (CSR).
- The device is a DIGITAL device, for which no diagnostic exists, that has been attached to the system. This may occur if a device that is not supported on a MicroVAX system has been attached.
- The device is a non-DIGITAL device that has been attached to the system.

3.2.3 Running the System Utilities

You choose Main Menu option 3, Display the System Utilities Menu, to run MDM utility programs. MDM utilities are services that help you use your MicroVAX more easily. MDM utilities perform the following functions:

- Supply the I/O addresses of the components and devices that MDM can test (see Section 3.2.3.1)
- Format disks (see Section 3.2.3.2)
- Update the RRD40 drive number (see Section 3.2.3.3 and Section 3.2.3.4)

NOTE: *Devices must be in the system, and their diagnostics must have already been loaded, before you perform these all operations but IOADDRES.*

After you choose the Display the System Utilities Menu option, a configuration is done. Then, MDM displays the System Utilities Main Menu. The menu's contents vary according to the devices configured into the tested system. Figure 3–12 is an example of a System Utilities Main Menu.

Enter the number of the option you want to run. MDM displays the corresponding menu that lets you run the utility.

Figure 3–12: Sample System Utilities Menu

```
MAIN  MENU                              Release nnn   Version Vxx.x
SYSTEM UTILITIES

 Utility selections are:

 1 - IOADDRES
 2 - RXAA - Disk drive formatter for RQDX controller A
 3 - RRAA - Update Drive Unit Number for RRD40 Controller A
 4 - RRAB - Update Drive Unit Number for RRD40 Controller B

Type the number, then press the RETURN key,
or type 0 and press the RETURN key to return to the Main Menu. >
```

NOTE:

The software for the utilities shown in items 2, 3, and 4 in this menu must be loaded and configured before they can appear in this menu.

3.2.3.1 IOADDRES Utility

You choose the IOADDRES System Utilities Menu option to find out devices' correct base Control and Status Register (CSR) addresses and base vector offsets. You use this information to verify and adjust devices' hardware and software settings. You also use the supplied information to add or remove a non-DIGITAL device from the configuration. Section 3.2.5 describes how to add or remove devices in Menu Mode.

After you choose the IOADDRES option, MDM prompts for the count of each type of MDM–supported device on your system by displaying the information shown in Figure 3–13 one line at a time. Respond to each line as follows:

- If one or more of the listed devices is connected to your system, enter the count of these devices. MDM displays the next line.
- If no device of that type is connected to your system, press only Return. MDM displays the next line.

Figure 3–13: MicroVAX Device Address Calculator Menu

```
IOADDRES - MicroVAX Device Address Calculator, V3.0

Enter the count of LPA (LPV11) Devices :
Enter the count of TSA (TSV05) Devices :
Enter the count of ZZZ (RQDXn, other MSCP) Devices : 1
Enter the count of ZZT (TK50, other TMSCP) Devices : 1
Enter the count of XQA (DEQNA) Devices : 1
Enter the count of DLA (DLV11) Ports (3 or 4 per controller) :
Enter the count of VVA (VSV21) Devices :
Enter the count of ZZQ (DZV11, DZQ11, DFA01) Devices : 1
Enter the count of ZZW (DRV11-W (DR11W mode)) Devices :
Enter the count of ZZB (DRV11-W (DR11B mode)) Devices :
Enter the count of DPA (DPV11) Devices :
Enter the count of DMA (DMV11) Devices :
Enter the count of ZZY (KMV1A, KMV1B) Devices :
Enter the count of IEA (IEQ11) Devices :
Enter the count of DHA (DHV11, CXA16) Devices : 1
Enter the count of DHF (DHF11, CXF32) Devices :
Enter the count of VCA (VCB01) Devices :
Enter the count of LAA (LNV11) Devices :
Enter the count of LNA (LNV21) Devices :
Enter the count of ZQA (Token Bus Adaptor) Devices :
Enter the count of DSA (DSV11) Devices :
Enter the count of ADC (ADV11-C) Devices :
Enter the count of AAC (AAV11-C) Devices :
Enter the count of AXA (AXV11-C) Devices :
Enter the count of KWA (KWV11-C) Devices :
Enter the count of ADA (ADV11-DA) Devices :
Enter the count of AAA (AAV11-DA) Devices :
Enter the count of VCB (VCB02) Devices :
Enter the count of DRB (DRV11-J) Devices :
Enter the count of QBA (DRQ3B) Devices :
Enter the count of IBA (IBQ01) Devices :
Enter the count of IDA (IDV11-A) Devices :
Enter the count of IDB (IDV11-B) Devices :
Enter the count of IDC (IDV11-C) Devices :
Enter the count of IDD (IDV11-D) Devices :
Enter the count of IAA (IAV11-A) Devices :
Enter the count of IAB (IAV11-B) Devices :
Enter the count of MIA (MIRA) Devices :
Enter the count of AQA (ADQ32) Devices :
Enter the count of CQA (DESNA) Devices :
Enter the count of DQA (DRQ11-C) Devices :
Enter the count of KXA (KXJ11) Devices :
```

When you have responded to the final prompt, MDM displays a summary of the devices supported on your system, as shown in Figure 3–14.

Figure 3–14: Summary Device Selections

```
Selections
Type : Count

ZZZ :  1
ZZT :  1
XQA :  1
ZZQ :  1
DHA :  1
```

MDM then displays the correct base CSR address (octal) and base vector offset (octal) of each set of devices of that family and the first available CSR address and vector offset, as illustrated in Figure 3–15.

You use the available addresses to calculate CSR addresses and vector offsets for additional non-DIGITAL devices.

To stop the program at any time before completion, enter EXIT. IOADDRES calculates the CSRs of the devices reported up to that time. You can now press Return to redisplay the System Utilities Menu, or enter 0 to redisplay the Main Menu.

Press Ctrl/C to terminate the program without listing CSR and vector information.

Figure 3–15: CSR and Vector Information

```
Device information
Type : CSR : Vector

ZZZ # 1 : 172150 : 154 (RQDXn, other MSCP)
ZZT # 1 : 174500 : 260 (TK50, other TMSCP)
XQA # 1 : 174440 : 120 (DEQNA)
ZZQ # 1 : 160100 : 300 (DZV11, DZQ11, DFA01)
DHA # 1 : 160500 : 310 (DHV11, CXA16)

First available floating CSR: 161306
First available floating vector: 320
```

3.2.3.2 Disk Drive Formatter Utility

You choose the Disk drive formatter for RQDX controller A option to format fixed-disk drives and RX33 diskettes. RF30 fixed-disk drives are pre-formatted and cannot be formatted by MDM.

CAUTION: *Running the formatting utility destroys all data on the disk. Use this utility only if you want to erase the contents of a disk.*

If you are formatting an RX33 diskette, remove the diskette's write-protect tab, insert the diskette into the diskette drive, and lock the lever.

If you are formatting a fixed-disk drive, set the drive's Write-Protect button to write-enable (out). Write-protect all other drives.

After you choose this option, MDM displays the formatting introductory screen and asks you if you want to continue, as illustrated in Figure 3–16. Enter 1 to continue.

Figure 3–16: Disk Drive Formatter Introductory Screen

```
 This DIGITAL Supported Software product is warranted to
 conform to the DIGITAL SOFTWARE PRODUCT DESCRIPTION (SPD)
 applicable for this product at the time of shipment.
 DIGITAL disclaims all other warranties, express or implied,
 including all warranties of merchantability and fitness
 for a particular purpose. Any use of this product in a
 manner inconsistent with the SPD is an unsupported use,
 for which DIGITAL assumes no liability.

WARNING, this utility will destroy any user data on the selected drive.

Do you want to continue [YES=1,(NO=0)] ? 1
```

If your system contains an RQDX3 controller, MDM displays a list of the drives and their unit numbers and prompts you for the unit number you want to format, as illustrated in Figure 3–17. Enter the number.

Figure 3–17: Sample List of Drives on System Screen

```
Controller information for Field Service personnel:
         MSCP Controller Model  #:  19
              Microcode Version #:  2

Your MicroVAX system contains the following drives:
            Unit    Drive Name
             0      RD53 Fixed Disk


 What unit do you want to format (0-0) ?
```

MDM asks you to verify that you have entered the correct unit number. If the unit number is incorrect, enter 0, and re-enter the unit number. If the unit number is correct, enter 1.

The formatting operation begins and MDM displays disk formatting progress messages, as illustrated in Figure 3–18.

The utility displays a success message after it completes a formatting operation and asks you if you want to format another unit.

Figure 3–18: Sample Formatting Messages Screen

```
Format Begun

Format is continuing - -  1 minutes into format

Format is continuing - -  2 minutes into format

Format is continuing - -  3 minutes into format
   .
   .
   .
Format is continuing - -  34 minutes into format

The drive has been formatted successfully.

Would you like to format another unit [YES=1, [NO=0)]?
```

- Enter 1 if you do want to format another unit. The formatting process begins again.
- Otherwise, enter 0. Then, MDM redisplays the System Utilities Menu.

3.2.3.3 RRD40 Drive Unit Number Utility

When your MicroVAX configuration contains multiple RRD40 disk drives, but only one disk controller, you can choose Update Drive Unit Number for RRD40 Controller A option. You use the utility to assign a unique unit number other than 0 to the second and subsequent disk drives.

After you choose this option, MDM displays the Read and Update RRD40 Drive Unit screen, as illustrated in Figure 3–19.

Figure 3–19: Update RRD40 Drive Unit Number

```
Read and Update RRD40 Drive Unit Number Utility Test

Please wait for the next prompt while this utility
determines the status of the RRDxx drives.

There is no drive connected to Port B.  Port B dropped from testing.

Determining Drive Unit Number for Drive connected to Port A.
Drive Type is RRD40  Unit Number: 255
Drive Type is RRD40  Unit Number: 255
This Utility allows you to update the RRD40 Drive Unit Number.
Which Port do you want to update?  Enter 0 for Port A, 1 for Port B.
```

Assign a unit number to your second and subsequent disk drives by responding to the prompt.

3.2.3.4 RRD40 Controller B Drive Unit Number Utility

You choose the Update Drive Unit Number for RRD40 Controller B option, when your system contains more than one controller.

Run this utility the same way you ran the utility for controller A. See Section 3.2.3.3.

3.2.4 Running the Service Options

To run the Service option, you must have the Maintenance Version of MDM. If you do, then you choose Main Menu option 4, Display the Service Menu, to do the following:

- Customize testing by setting test and message parameters (see Section 3.2.4.1)
- Test the system continuously under a heavy load (see Section 3.2.4.2)
- Test individual devices (see Section 3.2.4.3)
- Enter Command Line Mode (see Section 3.2.4.4)

After you choose Main Menu option 4, MDM displays the Service Menu, as illustrated in Figure 3–20.

Figure 3–20: Service Menu

```
MAIN MENU                          Release nnn   Version Vxx.x
SERVICE MENU

     CAUTION:  This menu is intended for use by qualified service
     personnel only.  Misuse of the commands could destroy data.

     1 - Set test and message parameters

     2 - Exercise system continuously

     3 - Display the Device Menu

     4 - Enter Command Line Mode

Type the number; then press the RETURN key,
or type 0 and press the RETURN key to return to the Main Menu.  >
```

Enter the number of the option you want to run. MDM displays the corresponding menu or performs the action you have directed.

3.2.4.1 Set Test and Message Parameters

You choose option 1, Set Test and Message Parameters, to control message and error reporting during diagnostic testing. After you choose this option, MDM displays the Test and Message Parameters menu, as illustrated in Figure 3–21. Displayed parameter settings are the current defaults.

Figure 3–21: Test and Message Parameters Menu

```
MAIN MENU                        Release nnn   Version Vxx.x
SERVICE MENU
TEST  AND  MESSAGE  PARAMETERS

         Parameter                                  Setting

     1 - Display test progress messages .......  ENABLED

     2 - Display detailed error messages ......  ENABLED

     3 - Stop testing on error ................  DISABLED

     4 - Ring bell on error ...................  DISABLED

Type the number of the parameter and press the RETURN key to
reverse the setting or type 0 and press the RETURN key to
return to the previous menu. >
```

A parameter can be set to either enabled or disabled. Select the option corresponding to the test parameter you want to enable or disable to change the current parameter to its opposite setting. MDM reverses the setting and displays a screen showing the new setting.

3.2.4.2 Exercise System Continuously

You choose option 2, Exercise System Continuously, to run one pass of each functional test on each enabled device and then run an exerciser test on all enabled devices. MDM continues to run the exerciser test until you press Ctrl/C.

Devices enabled for testing are all known devices that are shown in the System Configuration and Devices display, but that you have not specifically disconnected (see Section 3.2.5).

After you choose option 2, the diagnostics are configured. Communication devices require loopback connectors. MDM prompts you to install the appropriate loopback connectors on devices requiring them.

Certain exerciser tests destroy data. If tests destroy data, MDM displays a warning message, and you must confirm your intention to continue.

CAUTION: *MDM performs destructive tests on all disks and tapes in the system. Replace all removable media with blank media before testing begins.*

You must back up fixed disks, write-protect them or take them off line if they contain data or operating system programs.

3.2.4.3 Display the Device Menu

You choose option 3, Display the Device Menu, to run tests of a specific device and device-specific utilities.

After you choose option 3, MDM displays a list of devices in the system that have device-specific tests and, in some cases, device-specific utilities. Select the device you want to test, as illustrated in Figure 3–22.

Figure 3–22: Sample Device Menu

```
MAIN MENU                        Release nnn   Version Vxx.x
SERVICE MENU
DEVICE MENU

      This menu lets you select a device for testing.

      1 - CPUA -  MicroVAX/rtVAX CPU
      2 - MEMA -  MicroVAX/rtVAX memory system
      3 - RQDXA -  Winchester/diskette controller

Type the number; then press the RETURN key,
or type 0 and press the RETURN key to return to the previous menu. > 1
```

3.2.4.3.1 Device-Specific Menu

After you select the device, MDM displays the corresponding device-specific menu, which lists the test options for that device, as illustrated in Figure 3–23.

Figure 3–23: Sample Device-Specific Menu

```
MAIN MENU                       Release nnn   Version Vxx.x
SERVICE MENU
DEVICE MENU
CPUA - MicroVAX/RtVAX CPU MENU

      Testing is ENABLED

      1 - Enable/disable testing for device

      2 - Perform all functional tests

      3 - Perform the exerciser tests

      4 - Display the Device Utilities Menu

Type the number; then press the RETURN key,
or type 0 and press the RETURN key to return to the previous menu. >4
```

3.2.4.3.2 Utility Programs and Tests Menu

You can select a device-specific Utility Programs and Tests Menu. This menu displays all utilities available for that device. The number and type of utilities vary with the device. Figure 3–24 shows the menu displaying utilities available for MEMA, the MicroVAX memory system.

Figure 3–24: Sample Utility Programs and Tests Menu

```
MAIN MENU                       Release nnn   Version Vxx.x
SERVICE MENU
DEVICE MENU
MEMA - MicroVAX II Memory System MENU
UTILITY PROGRAMS AND TESTS MENU

      Utility selections are:

      1 - Print detailed memory map.
      2 - Extended free-standing memory test.

Type the number; then press the RETURN key,
or type 0 and press the RETURN key to return to the previous menu. >
```

There are three types of utilities:

- Testing utilities, which provide highly specialized testing, are run one at a time, and often require manual setup.
- Informational utilities, which inform you of the state of a device or help you interpret test results.

- Utility services, which perform functions not necessarily related to diagnostic testing—for example, formatting a fixed disk. This utility gives you greater control of the formatting operation than does the menu-driven utility.

3.2.4.4 Enter Command Line Mode

You choose Service Menu option 4, Enter Command Line Mode, to exit from Menu Mode and enter Command Line Mode. There are no menus in Command Line Mode. This selection lets you run tests by typing appropriate commands at a Command Line Mode prompt. For information about using Command Line Mode, see Chapter 4.

3.2.5 Connecting and Ignoring Devices and Diagnostics

CAUTION: *The Connect/Ignore Menu changes the MDM data base. Exercise extreme caution when using the menu. If you enter an incorrect CSR or vector address or misspell a device name, you may cause system failure.*

You choose Main Menu option 5, Display the Connect/Ignore Menu, to connect (add) or ignore (remove) devices and their diagnostics from the MDM configuration.

You can use the Connect/Ignore Menu to load and run diagnostics in a limited memory environment.

The MDM configuration is a tally of the devices that MDM recognizes, each one's Control and Status Register (CSRs), corresponding diagnostic program, vector offset, and Bus Request Level (BRL). MDM uses this information to run the correct diagnostic on the appropriate device.

After you choose Main Menu option 5, MDM displays the Connect/Ignore Menu, as illustrated in Figure 3–25.

Figure 3–25: Connect/Ignore Menu

```
MAIN  MENU                                  Release nnn   Version Vxx.x
CONNECT / IGNORE MENU
                          ** CAUTION**

 The following menus should be used with caution. If you are unfamiliar
 with the proper usage of these menus please exit to the Main Menu.

 Ctrl/C may be pressed to exit from these menus and will cause any
 connects or ignores for this session to be disregarded.

 1 - Connect parameter menu

 2 - Ignore parameter menu

 3 - Display Connect / Ignore menu

 4 - Activate Connect / Ignore menu

Type the number; then press the RETURN key,
or type 0 and press the RETURN key to return to the Main Menu. >
```

The four menu options allow you:

1. To connect (add) devices or diagnostic programs
2. To ignore (disconnect) devices or diagnostic programs
3. To find information on the current configuration
4. To activate the changes you have made

NOTE:

In the Connect/Ignore submenus, entering a 0 or a 1 has the same effect, even though the display instructions refer only to 0.

3.2.5.1 Connecting (Adding) Devices or Diagnostic Programs

You choose Connect/Ignore Menu option 1, the Connect Parameter Menu:

- To change a recognized device's parameters (CSR, corresponding diagnostic file name, vector offset, BR level)
- To connect a new device or diagnostic program to MDM
- To connect a previously ignored device or program to MDM

After you choose menu option 1, MDM displays the Connect Parameter Menu and prompts you for the CSR of the device.

After you enter the CSR, MDM displays new lines, one at a time, to prompt you for the file name of the diagnostic for the device connected to the CSR, its vector offset, and BR level. You enter each value; or you press only Return if you want to keep the file name, vector, and BR level already associated with the device.

MDM prompts you to confirm or disregard the parameter. After your response, MDM redisplays the Connect/Ignore Menu.

If you confirm the parameter, MDM adds the device and its diagnostic to the current configuration. You must now activate the change (see Section 3.2.5.4) by using option 4 of the Connect/Ignore Menu.

Figure 3–26 shows how you fill in the Connect Parameter Menu.

Figure 3–26: Connecting a Device and Diagnostic

```
MAIN  MENU                              Release nnn Version Vxx.x
CONNECT / IGNORE MENU
CONNECT PARAMETER MENU

     Type each parameter as requested and press RETURN

      ENTER CSR ......... 160500
      ENTER Filename .... NAXZY
      ENTER Vector ...... 340
      ENTER Br_level .... 4

     Filename      CSR    Vector  Br_level        Status
     DTEST        160500   340       4           CONNECTED

     Press RETURN if all parameters are correct,
      or type 1 and press RETURN to disregard the parameters. >
```

In the above example,

- The user connects the device to CSR 160500.
- The user connects the device to diagnostic program NAXZY. (Note: diagnostic file names are 5 characters long. The first two letters are always NA; the last three letters indicate the device.
- The user connects the device to vector offset 340.
- The user assigns the device to BR level 4.

If entries are incorrectly entered, MDM displays an invalid entry error message; then, MDM redisplays the Connect/Ignore Menu.

3.2.5.2 Ignoring (Disconnecting) Devices or Diagnostic Programs

You choose Connect/Ignore Menu option 2, the Ignore Parameter Menu, to remove devices from the list of those recognized by MDM. MDM does not load diagnostics of ignored devices and thereby reduces the time to load MDM into your MicroVAX. MDM configures only diagnostics that are loaded, so configuration also takes less time to finish.

After you choose option 2, MDM displays the Ignore Parameter Menu. You enter the CSR of the device you want MDM to ignore. (See Figure 3–27.) MDM prompts you to confirm or disregard this parameter.

If you confirm the parameter, MDM removes the device and its diagnostic from the current configuration and MDM redisplays the Connect/Ignore Menu. You must now use option 4 of the Connect/Ignore Menu to activate the change. See Section 3.2.5.4.

Figure 3–27: Ignore Parameter Menu

```
MAIN  MENU                              Release nnn   Version Vxx.x
CONNECT / IGNORE MENU
IGNORE PARAMETER MENU

     Enter the CSR address of the device to ignore and press RETURN.

      ENTER CSR ..... 160000

     Filename      CSR    Vector  Br_level        Status
     NAKAA        160000    000      0           IGNORED

Press RETURN if entry is correct, or type 0 and press RETURN to disregard. >
```

3.2.5.3 Finding Information about the Current Configuration

You choose Connect/Ignore Menu option 3, the Connect/Ignore Display Menu, to get information about the current configurations, including changes you have defined.[1] After you choose option 3, MDM displays the Connect/Ignore Display Menu, as illustrated in Figure 3–28.

This menu lists the current MDM configuration and the changes you want to make in the configuration—for example, adding the diagnostic NAXZY to the device connected to CSR 160500 and disconnecting the diagnostic NAKAA at CSR 160000. If no changes have been made, the current CSR display and the updated CSR display are identical.

The screen lists incorrectly configured or non-DIGITAL devices as having unknown file names. The configuration algorithm automatically skips 8 bytes after it discovers an unknown device. MDM may therefore list devices occupying 16 bytes as two devices and fail to recognize unknown devices occupying less than 8 bytes.

The only valid information MDM recognizes about an unknown device is its base CSR address. Use the Connect Menu to fill in all other parameters, in order for a diagnostic to be loaded against that device.

[1] MDM supports up to 30 diagnostic files.

Figure 3–28: Sample Connect/Ignore Display Menu

```
MAIN  MENU                                  Release nnn   Version Vxx.x
CONNECT / IGNORE MENU
CONNECT / IGNORE DISPLAY MENU

        CURRENT CSR DISPLAY                          UPDATED CSR DISPLAY

Filename    CSR  Vector Br   Status      Filename    CSR  Vector Br  Status

NAKAA     160000  000   0  CONNECTED     NAKAA     160000  000   0  IGNORED
NAMSA     160002  000   0  CONNECTED     NAMSA     160002  000   0  CONNECTED
NARXA     172150  154   4  CONNECTED     NARXA     172150  154   4  CONNECTED
NATKA     174500  260   4  CONNECTED     NATKA     174500  260   4  CONNECTED
NADMA     160320  300   4  CONNECTED     NADMA     160320  300   4  CONNECTED
NAXQA     174440  120   4  CONNECTED     NAXQA     174440  120   4  CONNECTED
                                         NAXZY     160500  340   4  CONNECTED

Press RETURN to return to the Connect / Ignore Menu. >
```

3.2.5.4 Activating the Changes You Have Made

You choose Connect/Ignore Menu option 4, the Connect/Ignore Activation Menu, to implement the changes you have made when you filled out the Connect Parameter Menu and/or the Ignore Parameter Menu.

After you choose option 4, MDM displays the Connect/Ignore Activation Menu and prompts you to confirm or disregard the configuration, as illustrated in Figure 3–29.

After you respond, MDM redisplays the Connect/Ignore Menu. If you confirm the configuration, MDM activates the changes you have made—for example, by ignoring diagnostic program NAKAA and adding diagnostic program NAXZY. This may take a minute or two.

After you have activated changes, you must reload the diagnostics by selecting a menu that tests or gives information about devices.

Figure 3–29: Sample Connect/Ignore Activation Menu

```
MAIN  MENU                                   Release nnn   Version Vxx.x
CONNECT / IGNORE MENU
CONNECT / IGNORE ACTIVATION MENU

       CURRENT CSR DISPLAY                          UPDATED CSR DISPLAY

Filename    CSR  Vector Br   Status     Filename    CSR  Vector Br  Status

NAKAA     160000  000   0  CONNECTED    NAKAA     160000  000   0  IGNORED
NAMSA     160002  000   0  CONNECTED    NAMSA     160002  000   0  CONNECTED
NARXA     172150  154   4  CONNECTED    NARXA     172150  154   4  CONNECTED
NATKA     174500  260   4  CONNECTED    NATKA     174500  260   4  CONNECTED
NADMA     160320  300   4  CONNECTED    NADMA     160320  300   4  CONNECTED
NAXQA     174440  120   4  CONNECTED    NAXQA     174440  120   4  CONNECTED
                                       NAXZY     160500  340   4  CONNECTED

 If updated CSR display is correct, press RETURN, or type 0 and
 press RETURN to return to the Connect / Ignore Menu. >
```

3.2.6 Testing Single Devices

You choose Main Menu option 6, Select Single Device Tests, to run functional and exerciser tests of a single device. This test is useful when system-wide testing offered by the Main Menu's Test the system option takes too much time.

After you choose the Select Single Device Test option, the diagnostics are configured and MDM displays a list of possible devices to test; you select a device to test, as illustrated in Figure 3–30. If the diagnostics have not been loaded, the system loads them before configuring them, and you must press Return after the configuration is completed.

Figure 3–30: Sample List of Devices to Test

```
MAIN MENU                                Release nnn   Version Vxx.x
SELECT SINGLE DEVICE TEST


       1 - CPUA - MicroVAX/rtVAX CPU
       2 - MEMA - MicroVAX II Memory System
       3 - RQDXA - Winchester/diskette controller.
       4 - TKXXA - TK50/TK70 CONTROLLER
       5 - DH-CX0A - DHV11 - 8 lines, Modem control
       6 - DEQNAA - Ethernet controller
       7 - Unknown - Diagnostic not loaded.
       8 - No Dg RED - Diagnostic not loaded.
       9 - No Ld JOE - Diagnostic not loaded.

Type the number, then press the RETURN key,
or type 0 and press the RETURN key to return to the Main Menu. > 0
```

3.2.6.1 Single Device Test Progress Messages

After you select the device, MDM configures the system, runs the selected device's functional and exerciser tests, and reports the results. However, if you select an option whose diagnostic is not loaded, such as option 9 of Figure 3–30, MDM displays the following message:

```
The device is unavailable for testing. Either the MDM system or
the device diagnostic has disabled testing. Consult your system
documentation for further information.
```

Testing usually takes less than 5 minutes, if you have chosen a valid diagnostic.

3.2.6.2 Single Device Test Error Message

MDM displays a failure message when it detects a problem with a device. The message identifies the source of the failure and the FRU associated with the failure, as illustrated in Figure 3–31.

Figure 3–31: Single Device Test Error Message

```
BEGIN FUNCTIONAL TEST

     Device                    Result

     DEQNAA ..................  FAILURE DETECTED

     A failure was detected while testing the

     OPTION: DEQNAA  Ethernet controller

     The Field Replaceable Unit (FRU) identified is the:

          Ethernet controller

     Consult your system documentation for the action to take.
```

3.2.6.3 Halting Single Device Testing

Press Ctrl/C to halt test execution. MDM stops running the diagnostic. Press Return to redisplay the Single Device Menu. Enter 0 or M to redisplay the Main Menu.[1]

[1] If you are testing a terminal device and press Ctrl/C, the terminal test may stop. If the test is running alone, it terminates, and MDM displays the CLM prompt (MDM>>). If the test is part of an exerciser test, all other tests continue.

Chapter 4
Command Line Mode

You can use MDM's interactive Command Line Mode (CLM) to control diagnostic execution by typing individual commands at the console terminal of the MicroVAX being tested. CLM offers all the functions allowed under Menu Mode and also lets you perform functions that Menu Mode does not allow, for example:

- Selecting individual tests within a diagnostic
- Setting time limits for testing
- Setting the number of passes for test runs
- Setting the system clock

4.1 Using CLM: Entering, Exiting, Syntax, and Messages

This section tells you how to perform the following functions:

- Enter CLM (See Section 4.1.1.2)
- Exit from CLM (see Section 4.1.2)
- Type CLM commands (see Section 4.1.3)
- Interpret CLM messages (see Section 4.1.4)

4.1.1 Entering CLM

You enter CLM either at boot time or from Menu Mode.

4.1.1.1 Entering CLM at Boot Time

Boot MDM software using one of the procedures outlined in Chapter 2. After you do, MDM asks you if you want to enter Menu Mode or Command Line Mode. Enter 2 to select Command Line Mode, as illustrated by Figure 4–1.

Figure 4–1: Selecting Menu Mode

```
The current date and time is:  6-AUG-1989 15:15:21.23
 Do you want to use Menu Mode or Command Line Mode?

  1 - Menu Mode
  2 - Command Line Mode

 Type the number; then press the RETURN key. > 2
```

After you select option 2, MDM asks you to confirm this choice by adding the following lines to the menu:

```
CAUTION:  You are about to enter command line mode.
There are no menus once you enter this mode.  Refer
to the MDM User's Guide for detailed instructions.

To return to menu mode from command line mode
type "RESTART" and press the RETURN key, or reboot
the system.

Type 2 and press the RETURN key to proceed, or
Type 1 and press the RETURN key to enter menu mode. > 2
```

Confirm your choice by selecting option 2. MDM continues loading its software and displays the MDM command prompt (MDM>>) when it is ready to accept commands.

4.1.1.2 Entering CLM from Menu Mode

To enter CLM from Menu Mode:

1. Choose Main Menu option 4, Display the Services Menu, as illustrated in Figure 4–2.
2. Choose Service Menu option 4, Enter Command Line Mode, as illustrated in Figure 4–3.

MDM displays a caution screen and then the MDM command prompt (MDM>>) when it is ready to accept commands.

Figure 4–2: Entering CLM from Menu Mode 1

```
MAIN MENU                                Release nnn   Version Vxx.x

1 - Test the system

2 - Display System Configuration and Devices

3 - Display the System Utilities Menu

4 - Display the Services Menu

5 - Display the Connect/Ignore Menu

6 - Select single device tests

Type the number; then press the RETURN key. > 4
```

Figure 4–3: Entering CLM from Menu Mode 2

```
MAIN MENU
SERVICE MENU

     CAUTION:  This menu is intended for use by qualified service
     personnel only.  Misuse of the commands could destroy data.

     1 - Set test and message parameters

     2 - Exercise system continuously

     3 - Display the device menu

     4 - Enter Command Line Mode

Type the number; then press the RETURN key,
or type 0 and press the RETURN key to return to the Main Menu. > 4
```

4.1.2 Exiting from CLM

From Command Line Mode, you can return to Menu Mode or terminate the MDM session.

4.1.2.1 Returning from CLM to Menu Mode

You use the RESTART command (see Section 4.2.12) to exit from CLM and enter Menu Mode, for example:

```
MDM>> RESTART
```

MDM displays the Main Menu.

4.1.2.2 Exiting from MDM

When in CLM, you use the EXIT command to exit from MDM. For example:

```
MDM>> EXIT
```

You can now press the Halt button on your processor's front panel and reboot the system software.

4.1.3 Typing CLM Commands

Each CLM command consists of a keyword and, optionally, one or more qualifiers. As with any command, you must terminate the command line by pressing the Return key.

The rules for entering CLM commands and qualifiers are as follows:

- You can type MDM commands and qualifiers in uppercase or lowercase characters.
- You can type letters, numbers, and the underscore character (_) in command qualifiers.
- You can type a string of numbers in qualifiers. Use commas to separate the numbers in the string.
- You can abbreviate commands to the minimum number of letters MDM needs to distinguish them from any other command.
- You can indicate a range of numbers by using a hyphen to separate the first and last numbers of the series.
- You separate the strings that make up a command line with blanks or tabs.
- You can type comments by beginning with an exclamation point (!). You can type the exclamation point (!) either after a command line or after a CLM prompt. MDM does not try to process comments but records them in the MDM log.

The following valid commands illustrate the CLM's flexible syntax:

```
MDM>> Start all
MDM>> ! This is a comment line
MDM>> SET MODE SERVICE
MDM>> SET MO     SE        !Same command as above
MDM>> SELECT 1
MDM>>       Set Detail  On
```

4.1.4 Understanding CLM Error Messages

If MDM cannot process a command line, it displays an appropriate error message and prompts you for a new command. For example, if you misspell a command word, the following message may appear:

```
MDM>> STAT

Invalid command

MDM>> START
```

If you type an incorrect command qualifier, CLM may list the correct qualifiers separated by vertical bars, as shown in the following example:

```
MDM>> SET PROGRESS ON

Invalid argument; Specify OFF|BRIEF|FULL

MDM>> SET PROGRESS BRIEF
```

MDM may also refer you to the HELP facility (see Section 4.2.9) to view the correct command syntax, for example:

```
MDM>> SET ON

Invalid SET command; Type HELP to get valid SET commands

MDM>> SET BELL ON
```

If you type a valid command that MDM cannot process, MDM displays a message explaining the reason. For example, if you try to start a diagnostic test that you previously disabled, MDM displays the following message:

```
MDM>> DISABLE CPUA
      .
      .
      .
MDM>> START CPUA

Indicated diagnostic is disabled
MDM>>
```

4.2 CLM Command Descriptions

This section gives a list of all CLM commands. Each command entry gives a command description and shows an example of command usage.

4.2.1 The Comment Tag (!)

You use the comment tag (an exclamation mark), !, to insert comments.

The format is: ! and the parameter is: comment.

4.2.1.1 Description

MDM ignores characters typed after the comment tag (!). Place the comment tag (!) before each line of text you want MDM to ignore.

Manufacturing personnel use this feature when they download MDM script files to tested systems.

4.2.1.2 Example

```
MDM>> ! This text is ignored by MDM.
```

MDM does not process the text typed between the comment tag (!) and Return.

4.2.2 CLEAR

You use the CLEAR command to cancel error information resulting from diagnostic testing.

The format is: CLEAR and the parameters are:

- CPU_DISPLAY
- ERROR_LOG

4.2.2.1 Description

The CLEAR command cancels either stored or displayed error information.

CPU_DISPLAY

Causes the LEDs on the CPU panel at the rear of the system to display zeroes (0).

ERROR_LOG

Deletes any error messages stored in the system's error log during diagnostic testing.

4.2.2.2 Example

```
MDM>> CLEAR CPU_DISPLAY
```

4.2.3 CONFIGURE

You use CONFIGURE to execute the autoconfiguration procedure in MicroVAX systems.

4.2.3.1 Restrictions

CONFIGURE should be used only with systems containing more than 2 Mbytes of memory.

The format is: CONFIGURE.

4.2.3.2 Description

CONFIGURE runs the autoconfiguration procedure that loads the diagnostics needed to test the particular system configuration.

It is important to use the CONFIGURE command under the following circumstances. Entering CLM from the mode selection display requires that you type the CONFIGURE command before running any diagnostic tests. Additionally, if a device is placed on line or off line during a testing session or is altered in any way, type the CONFIGURE command. This command prevents error messages resulting from a change in the device status.

4.2.3.3 Example

```
MDM>> CONFIGURE
```

MDM determines system devices and loads a diagnostic for each testable device. The system may ask you to install additional media.

4.2.4 CONNECT

You use CONNECT to load individual diagnostics at nonstandard CSR and vector addresses or to reconnect to previously ignored devices. You can use this command to load diagnostics in a limited memory environment.

CAUTION: *The CONNECT command changes the MDM data base. Exercise extreme caution when using it. If you enter an incorrect CSR or vector address or misspell a device name, you may cause system failure.*

The format is: CONNECT *parameter* and the parameters are:

- FILE_NAME *file name*
- VECTOR *vector address*
- BR_LEVEL *bus request level*

4.2.4.1 Restrictions

MDM does not accept this command if a configuration was performed in menu mode or if the CONFIGURE command was used previously. This means that diagnostics were assigned to their respective devices at DIGITAL's standard CSR and vector locations. If you already selected Menu Mode or used the CONFIGURE command, you must reboot MDM or use the RESET CONFIGURATION command in order to use the CONNECT command.

For information on testing devices located at nonstandard addresses, see Appendix A.

4.2.4.2 Description

The CONNECT command lets you custom configure a system. You can bypass DIGITAL's standard CSR addresses and assign individual diagnostics to their devices at the addresses you specify. Custom configuration lets you do the following:

- Test devices attached to the system at nonstandard CSR and vector locations
- Specify a subset of diagnostics for loading, which can reduce load time

During autoconfiguration, MDM uses DIGITAL's standard CSR address assignments to recognize devices and to assign diagnostics to these devices. If an MDM-supported device is configured to a nonstandard CSR address, MDM cannot test it. If you type the SHOW BUS command, an `Invld Dev` (invalid device) message appears under the file name heading for each such device. To test the device, use the CONNECT command to assign a diagnostic to the device at the CSR address shown in the SHOW BUS display or to a different CSR address.

To reduce diagnostic loading times, use the CONNECT command with the SET AUTOCONFIGURATION OFF command in order to load individual diagnostics.

CSR address

A device's CSR address in octal. To view the current CSR addresses for system devices, type the SHOW BUS command.

You can use the CSR address shown in the SHOW BUS display or a different CSR address. The CSR address is the only mandatory qualifier needed to complete a valid CONNECT command.

This may not be the actual physical setting on the board. To ensure correct switch settings on the board, you must physically examine the device. The diagnostics use the physical switch setting, so they may fail if the setting is incorrect.

FILE_NAME file name

The name of a device's diagnostic program. To view the diagnostic file names, type the SHOW BUS command. File names are in the form NA*xxx* where:

- NA is the standard prefix for a diagnostic file name.
- *xxx* represents the device name.

For example, the diagnostic file name of the KA630 CPU is NAKAA. If an MDM-supported device is attached to the system, but its file name does not appear in the SHOW BUS display, refer to the *MDM Release Notes* for a complete list of all currently supported devices and their file names.

If you do not enter a new file name, MDM uses the 5-character diagnostic file name of the current device as shown in the SHOW BUS display for a default.

VECTOR vector address

The device's vector address in octal. To view the vector addresses for the system devices, type SHOW BUS.

If you do not type a value for the vector address, the current vector address of the device is used as a default.

BR_LEVEL bus request level

A number from 0 to 7 indicating the bus request level of the device. To view the current bus request levels for the system devices, type the SHOW BUS command.

If you do not type a value for the bus request level, the current bus request level of the device is used as a default value.

4.2.4.3 Example

```
MDM>> CONNECT 160500 FILE_NAME NADHA VECTOR 330 BR_LEVEL 4
```

The diagnostic file for the DHV11 (NADHA) is assigned to the device at CSR address 160500, vector address 330, and bus request level 4. The DHV11 diagnostic loads at these values when the system is configured.

```
MDM>> CONNECT 170500
```

The device at CSR address 170500 is assigned the current default values for diagnostic file name, vector address, and bus request level. At configuration time, the default diagnostic file is loaded at the specified CSR address and at the default values for vector address and bus request level.

```
MDM>> CONNECT 170500 FILE_NAME NATKA VECTOR 300
```

The TK50 diagnostic file (NATKA) is assigned to the device at CSR address 170500. The vector address is set to 300. The current value for bus request level is used as the default value.

4.2.5 Ctrl/C

You press Ctrl/C to cause the system to go into Ctrl/C Mode.

The format is: Ctrl/C

4.2.5.1 Restrictions

MDM accepts this command only during diagnostic testing.[1]

CAUTION: *Do not press Ctrl/C to terminate a diagnostic that you are running from a remote terminal. If you do, you lose the connection to the tested system.*

4.2.5.2 Description

Ctrl/C Mode is designed to allow you to display information about the system during diagnostic testing. For a complete description of Ctrl/C Mode, refer to Chapter 5.

4.2.5.3 Example

```
MDM>> Ctrl/C
MDM Ctrl/C>>
```

Diagnostic tests continue to run, but progress and error messages do not appear. The twenty most recent messages are buffered. If a diagnostic sends more than 20 messages while MDM operates in Ctrl/C Mode, previous messages are lost. However, lost errors are still counted in the MDM error log, which will reflect this number after MDM exits from Ctrl/C Mode.

4.2.6 DISABLE

You use the DISABLE command to prevent diagnostic program(s) specified by name, number, or the ALL qualifier from running.

The format is: DISABLE and the parameters are:

- ALL
- *diagnostic name*
- *diagnostic number*

[1] If you are testing a VCB-type terminal device and press Ctrl/C, the terminal test may stop. If the test is running alone, it terminates, and MDM displays the CLM prompt (MDM>>). If the test is part of an exerciser test, all other tests continue.

4.2.6.1 Description

Using the DISABLE command without a qualifier prevents the diagnostic currently chosen with the SELECT command from running. To display the currently selected diagnostic and to show enabled/disabled information, use the SHOW DEFAULT command.

To view all diagnostic names and numbers available for the system and to determine whether they have been enabled or disabled, use the SHOW CONFIGURATION command.

ALL

Prevents all diagnostic programs from running.

diagnostic name

Prevents the specified diagnostic from being run.

diagnostic number

Prevents the specified diagnostic number from being run.

4.2.6.2 Examples

```
MDM>> DISABLE RQDXA
```

Disables the RQDXA diagnostic.

```
MDM>> DISABLE 4
```

Disables the fourth diagnostic.

```
MDM>> DISABLE
```

Disables the currently selected diagnostic.

4.2.7 ENABLE

You use the ENABLE command to prepare to run diagnostic program(s) specified by name, number, or the ALL qualifier.

The format is: ENABLE and the parameters are:

- ALL
- *diagnostic name*
- *diagnostic number*

4.2.7.1 Description

Using the ENABLE command without a qualifier enables the diagnostic currently chosen with the SELECT command to run. To display the currently selected diagnostic and to show enabled/disabled information, use the SHOW DEFAULT command.

To view all diagnostic names and numbers available for the system and to determine whether they have been enabled or disabled, use the SHOW CONFIGURATION command.

ALL

Prepares all diagnostic programs to run.

diagnostic name

Prepares the diagnostic whose name is specified to run.

diagnostic number

Prepares the diagnostic whose number is specified to run.

4.2.7.2 Examples

```
MDM>> ENABLE 2
```

Prepares the second diagnostic to run.

```
MDM>> ENABLE MEMA
```

Prepares the memory diagnostic to run.

```
MDM>> ENABLE
```

Prepares the currently selected diagnostic to run.

4.2.8 EXIT

You use the EXIT command to exit from MDM software.

The format is: EXIT

4.2.8.1 Description

Using the EXIT command causes the system to exit from MDM. You can then reboot the tested system.

4.2.8.2 Example

```
MDM>> EXIT
```

After you issue this command, MDM displays its exit screen. You now press [Halt] on the front panel.

4.2.9 HELP

You use the HELP command to display a list of CLM commands.

The format is: HELP

4.2.9.1 Description

Displays an alphabetized list of commonly used CLM commands with definitions.

4.2.9.2 Example

```
MDM>> HELP
```

MDM displays a list of CLM commands.

4.2.10 IGNORE

You use the IGNORE command to prevent the diagnostic assigned to the specified CSR address from being loaded during system configuration. You can use this command to prevent diagnostics from being loaded into a limited memory environment.

CAUTION: *The IGNORE command changes the MDM data base. Exercise extreme caution when using it. Incorrect use may cause system failure.*

The format is: IGNORE and the parameter is: CSR address

4.2.10.1 Restrictions

MDM does not accept this command if a configuration was performed in Menu Mode or the CONFIGURE command was used previously. These conditions mean that diagnostics were assigned to their respective devices. If you have already performed a menu-mode operation that configures MDM or have used the CONFIGURE command, you must execute the RESET CONFIGURATION command or reboot MDM in order to use the IGNORE command.

4.2.10.2 Description

In issuing the IGNORE command, use the current CSR addresses for the system devices, as displayed by the SHOW BUS command.

4.2.10.3 Example

```
MDM>> IGNORE 160000
```

The CPU diagnostic at CSR address 160000 is not to be loaded when the system is configured. Additional system diagnostics that were not ignored are loaded automatically.

4.2.11 RESET CONFIGURATION

You use the RESET CONFIGURATION command to set the system to an unconfigured state.

The format is: RESET CONFIGURATION.

CAUTION: *You must reload diagnostics before you run further tests. Reloading may take several minutes.*

4.2.11.1 Example

```
MDM>> RESET CONFIGURATION
```

4.2.12 RESTART

You use the RESTART command to enter Menu Mode from CLM.

The format is: RESTART

4.2.12.1 Description

Upon exiting CLM and entering Menu Mode, MDM displays the Main Menu.

4.2.12.2 Example

```
MDM>> RESTART
```

4.2.13 RUN

You use the RUN command to execute a specified system utility.

The format is: RUN and the parameter is: *system utility*.

Use the SHOW SYSTEM_UTILITIES command to view a list of system utilities.

4.2.13.1 Example

```
MDM>> RUN IOADDRES
```

4.2.14 SELECT

You use the SELECT command to choose the diagnostic used as the default in a subsequent ENABLE, DISABLE, SHOW, or START command.

The format is: SELECT and the parameters are:

- *diagnostic name*
- *diagnostic number*
- NEXT

4.2.14.1 Description

NEXT is a pointer whose numerical value can be used as the default diagnostic number in ENABLE, DISABLE, SHOW, or START commands. If you enter CLM directly from the MDM selection display, the NEXT pointer has a default value of 1.

To set the NEXT pointer equal to a value of zero, use the SELECT command without a qualifier. To increase the value of NEXT by 1, use the SELECT NEXT command.

diagnostic name

Selects the specified diagnostic by name as the default used in ENABLE, DISABLE, SHOW, and START commands.

diagnostic number

Selects the specified diagnostic by number as the default used in ENABLE, DISABLE, SHOW, and START commands.

NEXT

The value of NEXT is used as the default diagnostic number in ENABLE, DISABLE, SHOW, and START commands.

4.2.14.2 Examples

```
MDM>> SELECT NEXT
```

Increases the value of the NEXT pointer by 1 and selects that device.

```
MDM>> SELECT 1
```

Selects the first diagnostic to be used as the default in subsequent ENABLE, DISABLE, SHOW, or START commands.

```
MDM>> SELECT MEMA
```

Selects the memory diagnostic to be used as the default in subsequent ENABLE, DISABLE, SHOW, or START commands.

4.2.15 SET

You use the SET command to prepare the system to run diagnostics.

The format is: SET and the parameters are:

- AUTOCONFIGURATION OFF
- AUTOCONFIGURATION ON
- BELL OFF
- BELL ON
- CLOCK *dd-mmm-yyy hh:mm*
- DETAILED_MESSAGES OFF
- DETAILED_MESSAGES ON
- ERROR CONTINUE
- ERROR HALT
- ERROR_LOG *number*
- MODE SERVICE
- MODE VERIFY
- PASSES *number*
- PASSES 0
- PROGRESS BRIEF
- PROGRESS FULL
- PROGRESS OFF
- SECTION EXERCISER
- SECTION FUNCTIONAL
- SECTION UTILITY
- TEST ALL
- TEST *range*

- TIME *dddd hh:mm:ss*
- TIME 0

4.2.15.1 Description

Prepares the system for testing by allowing the selection of testing parameters and message reporting. This command also lets you set the system clock.

AUTOCONFIGURATION OFF

Prevents MDM from loading a diagnostic for each device attached to the system at standard CSR and vector addresses.

Sets a diagnostic's default status to IGNORED in the SHOW BUS display. The SET AUTOCONFIGURATION OFF command does not change the status of a device if you previously used the CONNECT command with the device. Use additional CONNECT and IGNORE commands to change the device's status.

AUTOCONFIGURATION ON

Sets a diagnostic's default status to CONNECTED in the SHOW BUS display. The SET AUTOCONFIGURATION ON command does not change the status of a device if you previously used the IGNORE command with the device. Use additional CONNECT or IGNORE commands to change the device's status.

BELL OFF

Prevents the terminal bell from ringing for error messages.

BELL ON

Sets the terminal bell to ring for each error message.

CLOCK dd-mmm-yyyy hh:mm

Sets the system's internal time-of-year clock. The system clock displays the date and time with diagnostic error messages.

DETAILED_MESSAGES OFF

Stops diagnostic detailed message reporting.

DETAILED_MESSAGES ON

Allows diagnostic detailed messages to be displayed.

ERROR CONTINUE

Causes a diagnostic to continue running when an error is detected.

ERROR HALT

Causes all diagnostics to stop running when an error is detected by any diagnostic. You can use the SHOW ERROR command for an explanation of the error.

ERROR_LOG number

Sets the number of error messages stored during diagnostic testing. The maximum number is 20.

MODE SERVICE

Enables both Service and Verify Mode tests to run.

MODE VERIFY

Enables only Verify Mode tests to run.

PASSES *number*

Selects the number of test passes to run.

NOTE: *Full progress reports display a diagnostic's pass count as testing progresses. Once the number reaches 32767, MDM starts the count at –32768 and continues to count in ascending order (–32767, –32766, and so on).*

PASSES 0

Causes diagnostic tests to run indefinitely. To stop test execution, you must press Ctrl/C and enter a HALT command or use the SET TIME command.

NOTE: *If you are running functional or utility tests, set PASSES to 0, and START ALL diagnostic tests running, only the first diagnostic executes, because it runs for an infinite number of passes.*

PROGRESS BRIEF

Enables brief progress messages to appear during diagnostic testing. Brief messages tell when a test has started and whether a device has passed or failed the test.

PROGRESS FULL

Enables full progress messages to appear during diagnostic testing. Full progress messages give the information shown in brief progress messages plus the currently running test number and test pass.

PROGRESS OFF

Stops progress message reporting.

SECTION EXERCISER

Establishes that exerciser tests run for the selected diagnostics.

SECTION FUNCTIONAL

Establishes that functional tests run for the selected diagnostics.

SECTION UTILITY

Establishes that utility tests run for the selected diagnostics.

TEST ALL

Prepares all tests specified with the SET SECTION command to run. Cancels the effect of the SET TEST *range* command.

TEST *range*

Selects the tests that run with the START command by specifying an individual test number or a range of test numbers. Available test selections and their numbers are displayed with the SHOW DEVICE TESTS or SHOW DEVICE UTILITIES command. The range can be specified with commas and hyphens.

TIME dddd hh:mm:ss

Sets a time limit for diagnostic tests to run.

TIME 0

Causes diagnostic tests to run indefinitely. To stop diagnostic testing, you must press Ctrl/C and use the HALT command or use the SET PASSES number command.

4.2.15.2 Examples

```
MDM>> SET BELL ON
```

Sets the terminal bell to ring for each error message.

```
MDM>> SET TEST 1,3,5-7
```

Test numbers 1, 3, 5, 6, and 7 of a diagnostic are set to run.

```
MDM>> SET TEST 3
```

Test 3 from a diagnostic is set to run.

```
MDM>> SET TIME 3 9:30:15
```

Diagnostic tests run for 3 days, 9 hours, 30 minutes, and 15 seconds.

```
MDM>> SET TIME 22:00:00
```

Diagnostic tests run for 22 hours.

```
MDM>> SET SECTION EXERCISER
```

Only exerciser tests are set to run.

4.2.16 SHOW

You use the SHOW command to display selected information.

The format is: SHOW and the parameters are:

- BUS
- CLOCK
- CONFIGURATION BRIEF
- CONFIGURATION FULL
- DEFAULT
- DEVICE
- DEVICE FRUS
- DEVICE TESTS
- DEVICE UNITS
- DEVICE UTILITIES
- DISABLE
- DISCLAIMER
- ERRORS
- MEMORY
- SYSTEM_UTILITIES

4.2.16.1 Description

Allows you to display selected information about the system, the system devices, and diagnostic tests.

BUS

Tells whether autoconfiguration is on or off. Lists information about each system device and diagnostic, as follows:

- File name of diagnostic
- CSR address (octal)
- Primary vector address (octal)
- Bus request level (BR_LEVEL)
- Status of the diagnostic as follows:

Status	Meaning
Connected	The device's diagnostic is loaded when the system is configured.
Ignored	The device's diagnostic is not loaded when the system is configured.

The SHOW BUS command lists devices configured incorrectly or non-DIGITAL devices as "unknown." The configuration algorithm automatically skips 8 bytes after it discovers an unknown device. MDM may therefore list devices occupying 16 bytes as two devices and fail to recognize unknown devices occupying less than 8 bytes.

The only valid information MDM recognizes about an unknown device is its base CSR address. Use the CONNECT command to fill in all other parameters, in order for a diagnostic to be loaded for that device.

The following example lists unknown devices at addresses 175450 and 177040; these devices may be non-DIGITAL. The only valid information known about each device is its base CSR address. As with any reading in the SHOW BUS display, if a field is not set, the device comes up as unknown in the configuration. In order for a diagnostic to be loaded against a device, fill in all parameters.

```
Autoconfigure set ON

FILENAME      CSR      VECTOR     BR_LEVEL    STATUS

 NAKAAB     160000       000          0       CONNECTED
 NAMSAC     160002       000          0       CONNECTED
 NARXAN     172150       154          4       CONNECTED
 NAXQAI     174440       120          5       CONNECTED
 UNKNOWN    175450       000          0       IGNORED
 NADHAK     160440       300          4       CONNECTED
 UNKNOWN    177040       000          0       IGNORED
```

CLOCK

Displays the current date and time.

CONFIGURATION BRIEF

Lists the system configuration, giving each device a number to be used as the diagnostic number in ENABLE, DISABLE, SELECT, or START commands. Each device displays an enabled/disabled message telling whether the device diagnostic is set to run.

CONFIGURATION FULL

Lists configuration information that describes modules and drives.

DEFAULT

Lists all testing parameters selected with the SET and SELECT commands.

DEVICE

Lists the CSR address, vector address, bus request level, and number of vectors for a selected device.

DEVICE FRUS

Lists information about a selected device's FRUs. The information includes the numbers and types of FRUs that the diagnostic can test.

DEVICE TESTS

Lists the functional tests and exercisers for a selected device, giving each test a number to be used in the SET TEST command.

DEVICE UNITS

Lists the unit numbers with descriptions for a selected device.

DEVICE UTILITIES

Lists the utilities available for a selected device.

DISABLE

Provides information on why certain diagnostics are disabled. If a diagnostic raises an exception and if the Diagnostic Service Library (DSL) detects it, the exception value (EXCEPTION), Processor Status Longword (PSL), and Program Counter (PC) are saved. Issue the SHOW DISABLE command to display these values.

DISCLAIMER

Displays the software copyright and the version of MDM.

ERRORS

Lists the first error message and the five most recent error messages reported by the diagnostics. This number can be changed by using the SET ERROR_LOG command. This command also lists error numbers and failing FRUs.

MEMORY

Displays information about the system's memory, such as: total memory, total free memory, and total number of free system objects.

SYSTEM_UTILITIES

Lists available system utilities.

4.2.16.2 Examples

```
MDM>> SHOW DEFAULT
```

Lists all testing parameters selected with the SET command, as in the following example:

```
   1     CPUA Enabled KA630-AA 1MB, FPU MC=00 HW=00
Mode is SERVICE
Section is FUNCTIONAL
Number of passes is: 3
No time limit
Tests to be run: 2 3
Continue on error
Bell on error OFF
Detailed message is On
Progress message is Full

MDM>> DIS 2
MDM>> DIS 4
MDM>> SHOW DISABLE

      FILENAME     PC      PSL      EXCEPTION
                  (HEX)   (HEX)     (HEX)

 2    CPUA          0       0        00000000
 4    MEMA          4839    162      00007C04

FILENAME  - name of disabled diagnostic
PC        - program counter  (default = 0)
PSL       - process status longword  (default = 0)
EXCEPTION - error exception value (default = 0)

An exception number of 0 indicates the diagnostic has disabled
itself.
```

This example shows that the MEMA diagnostic raised an exception that DSL was able to detect. The CPUA diagnostic did not raise an exception. If a diagnostic disables itself, or if a user disables the diagnostic and no exception is raised, the PC, PSL, and EXCEPTION display the default value of zero. To display the following message, enter the SHOW DISABLE command with all diagnostics enabled:

```
ALL diagnostics are enabled.
```

Refer to the kernel message chart in the appendix for exception number translations.

4.2.17 START

You use the START command to run specified diagnostic program(s) according to the testing parameters established with the SET command.

The format is: START and the parameters are:

- ALL
- *diagnostic name*
- *diagnostic number*

4.2.17.1 Description

Specify the diagnostic program(s) by name, number, or the ALL qualifier. The START command used without a qualifier runs the currently selected diagnostic program. To view the currently selected diagnostic and test parameters, type the SHOW DEFAULT command.

ALL

Causes all enabled diagnostic programs to run according to the testing parameters established with the SET command. ENABLED diagnostic programs are displayed with a SHOW CONFIGURATION command.

diagnostic name

Causes the specified diagnostic name to run according to the testing parameters established with the SET command.

diagnostic number

Causes the specified diagnostic number to run and test a device according to the testing parameters established with the SET command.

4.2.17.2 Example

```
MDM>> START ALL
```

Causes all enabled diagnostic programs to run according to the testing parameters established with the SET command.

4.2.18 UNITS

You use the UNITS command to enable or disable diagnostic testing of an individual unit (drive) on a controller.

The format is: UNITS and the parameters are:

- *diagnostic name*
- *diagnostic number*
- DISABLE
- ENABLE
- *unit range*

4.2.18.1 Description

When you boot MDM, unit testing is enabled by default. To view a device's unit numbers, use the SELECT command to select the device and type the SHOW DEVICE UNITS command.

diagnostic name

Specifies a controller by its diagnostic name.

diagnostic number

Specifies a controller by its diagnostic number.

ENABLE

Prepares a unit for testing.

DISABLE

Prevents a unit from undergoing testing.

unit range

Specifies an individual unit (drive) by its number or a range of units by their numbers. The range of numbers is from 0 to 1023.

4.2.18.2 Examples

```
MDM>> UNITS RQDXA ENABLE 2
```

Drive number 2 on the RQDXA controller is enabled for diagnostic testing.

```
MDM>> UNITS 3 DISABLE 3-5
```

Units 3, 4, and 5 on the controller specified by diagnostic number 3 are disabled from diagnostic testing.

```
MDM>> UNITS KDA50A ENABLE 0,1,2
```

Units 0, 1, and 2 on the KDA50A controller are enabled for diagnostic testing.

Chapter 5
Ctrl/C Mode

You use MDM's Ctrl/C Mode commands after you have started one or more diagnostics. You type Ctrl/C Mode commands to:

- Show information about the MicroVAX system while diagnostics are running
- Show the selected test parameters controlling diagnostic execution
- Halt diagnostic execution and return control to Command Line Mode (CLM)

5.1 Entering Ctrl/C Mode

You enter Ctrl/C Mode by pressing Ctrl/C while a diagnostic is running.[1]

After you press Ctrl/C, MDM displays its Ctrl/C Mode command prompt (MDM Ctrl/C>>).

You issue Ctrl/C Mode commands by typing the command and any qualifiers. (See Section 4.1.3 for a full discussion of command syntax.)

If you do not type a complete command, MDM prompts you for the appropriate arguments.

5.2 Exiting from Ctrl/C Mode

Type the HALT command to exit from Ctrl/C Mode and return to CLM. MDM resumes displaying the current diagnostic's progress and error messages and displays the command line prompt (MDM>>) once testing is complete.

[1] If you press Ctrl/C when diagnostics are not running, MDM displays the error message Invalid Command.

If you are testing a VCB-type terminal device and press Ctrl/C, the terminal test may stop.

5.3 Ctrl/C Command Descriptions

This section gives a list of Ctrl/C Mode commands, each command's description, and an example of its use.

5.3.1 CONTINUE

You use the CONTINUE command to exit from Ctrl/C Mode and to continue with the testing in progress.

The format is: CONTINUE. There are no parameters.

MDM resumes displaying the progress and error messages resulting from currently running diagnostic tests.

```
MDM Ctrl/C>> CONTINUE
```

5.3.2 HALT

You use the HALT command to stop a running diagnostic and return to CLM.

The format is: HALT. There are no parameters.

This command cancels Ctrl/C Mode. MDM may display stored diagnostic messages before it displays the CLM prompt (MDM>>).

The HALT command:

- Returns all running devices to a neutral state
- Resets the tested devices' error indicator lights to show an error-free condition

```
MDM Ctrl/C>> HALT
```

5.3.3 SHOW

You use the SHOW command to view selected information.

The format is: SHOW and the parameters are:

- BUS
- CLOCK
- CONFIGURATION BRIEF
- CONFIGURATION FULL
- DEFAULT

- DEVICE
- DEVICE FRUS
- DEVICE TESTS
- DEVICE UNITS
- DEVICE UTILITIES
- DISCLAIMER
- ERRORS
- MEMORY

This command allows you to display selected information about the system, system devices, and diagnostic tests.

BUS

Tells whether autoconfiguration is on or off. Lists information about each system device and diagnostic as follows:

- File name of diagnostic
- CSR address (octal)
- Primary vector address (octal)
- Bus request level (BR_LEVEL)
- Diagnostic status as follows:

Status	Meaning
Connected	The device's diagnostic is loaded when the system is configured.
Ignored	The device's diagnostic is not loaded when the system is configured.

CLOCK

Displays the current date and time.

CONFIGURATION BRIEF

Lists the system configuration, giving each device the number to be used as the diagnostic number in the ENABLE, DISABLE, SELECT, or START commands. Each device displays an enabled/disabled message to show whether its diagnostic is set to run.

CONFIGURATION FULL

Lists additional configuration information that describes modules and drives.

DEFAULT

Lists all testing parameters selected with the SET command.

DEVICE

Lists the CSR address, vector address, bus request level, and number of vectors associated with a selected device.

DEVICE FRUS

Lists information about a selected device's FRUs. The information includes the numbers and types of FRUs that the diagnostic tests.

DEVICE TESTS

Lists the functional tests and exercisers for a selected device, giving each test a number to be used in the SET TEST command.

DEVICE UNITS

Lists the unit numbers with descriptions for a selected device.

DEVICE UTILITIES

Lists the utilities available for a selected device.

DISCLAIMER

Displays the software copyright and the version of MDM.

ERRORS

Lists the first error message and five most recent error messages reported by the diagnostics. This command also lists error numbers and failing FRUs.

MEMORY

Displays information about the system's memory, such as: total memory, total free memory, and total number of free system objects.

```
MDM Ctrl/C>> SHOW DEFAULT
```

Lists all testing parameters selected with the SET command.

Appendix A
Using Command Line Mode to Customize Testing

You can use Command Line Mode (CLM) to:

- Test single devices without configuring MDM (see Section A.1)
- Test devices whose CSRs are located at nonstandard addresses (see Section A.2)
- Load individual diagnostics (see Section A.3)
- Prevent the loading of individual diagnostics (see Section A.4)
- Select test parameters (see Section A.5)

A.1 Testing Devices Using Autoconfiguration

You can use CLM to test individual devices by selecting the device you want to test from the standard MDM configuration.

The following steps give an example of selecting and testing a single device.[1]

1. Use the CONFIGURE command to configure the MDM system.

   ```
   MDM>> CONFIGURE
   ```

   MDM sets up a list of the tested system components and devices.

2. Use the SHOW CONFIGURATION command to view the devices recognized by MDM.

   ```
   MDM>> SHOW CONFIGURATION BRIEF
   ```

[1] If you are testing a VCB-type terminal device and press Ctrl/C, the terminal test may stop. If the test is running alone, it terminates, and MDM displays the CLM prompt (MDM>>). If the test is part of an exerciser test, all other tests continue.

MDM displays the current configuration.

```
1      CPUA   Enabled KA630-AA 1MB, FPU MC=00 HW=00
2      MEMA   Enabled 2 megabytes. 4096 Pages.
3      RQDXA  Enabled Revisions =11 and 6
4      DEQNA  Enabled DEQNA AA-00-03-01-37-03
```

The enabled message after each device name indicates that the device is ready for testing.

3. Use the SHOW default command to view MDM's default testing parameters.

```
MDM>> SHOW DEFAULT
```

MDM displays the testing defaults.

```
no device selected
Mode is SERVICE
Section is FUNCTIONAL
Number of passes is: 1
No time limit
Tests to be run:  ALL
Continue on error
Bell on error OFF
Detailed message is On
Progress message is Full
```

No device has been selected for testing.

4. Use the SELECT command to choose the device to be tested. For example, type the following command to test the CPUA device:

```
MDM>> SELECT 1
```

The qualifier 1 is the CPUA diagnostic number the system displayed in response to the SHOW CONFIGURATION command

5. Use the SHOW DEVICE TESTS command to view the diagnostic tests available for CPUA.

```
MDM>> SHOW DEVICE TESTS
```

MDM displays a list of available tests:

```
CPUA   MicroVAX CPU
 Functional tests-
     1v - Basic instruction test series, verify mode
     2v - Floating-point instruction test series, verify mode
     3s - Basic instruction test series, service mode
 Exerciser tests-
     1v - CPU access monitor routine, verify mode
     2s - CPU access monitor routine, service mode
```

In the above display, the symbol v following a test number denotes a test that runs in verify mode and service mode and the symbol s denotes a test that runs in service mode.

Refer to the display resulting from the SHOW DEFAULT command in step 3. The displayed default settings `Mode is SERVICE, Section is FUNCTIONAL,` and `Tests to be run: ALL` mean that all functional tests that are listed will run.

Each line in the defaults display shows a test or message parameter that you can change with a SELECT or SET command. For example, to change the number of test passes from 1 to 2, type:

```
MDM>> SET PASSES 2
```

The functional tests are now set to run twice.

6. Retype the SHOW DEFAULT command to verify that the defaults have changed.

7. Use the START command to start the CPUA diagnostic.

```
MDM>> START
```

After you start the diagnostics, MDM tests CPUA and displays progress messages reflecting the defaults as it does:

```
CPUA started.
CPUA pass 1 test number 1 started.
CPUA pass 1 test number 2 started.
CPUA pass 1 test number 3 started.
CPUA pass 2 test number 1 started.
CPUA pass 2 test number 2 started.
CPUA pass 2 test number 3 started.
CPUA passed.
MDM>>
```

A.2 Testing a Device at a Nonstandard CSR Address

DIGITAL-supported devices are sometimes installed at nonstandard CSR addresses. You must connect them yourself in order to run their diagnostics. The following sequence of commands shows you how to do this.

In the example, the system devices and their diagnostic file names are as follows:

Device	File Name
KA630	NAKAA
MEMA	NAMSA
DEQNA	NAXQA
TK50	NATKA
VSV21	NAVVA
DHV11	NADHA
RQDX3	NARXA

The following procedure indicates how to connect the DHV11 and its diagnostic, which are configured at nonstandard addresses:

NOTE: *MDM does not carry out the listed procedure if you have already issued the CONFIGURE command or entered CLM from Menu Mode where the system had previously been configured.*

1. Boot the system and enter Command Line Mode (CLM).
2. Type the SHOW BUS command to view the system's testable devices.

MDM displays a table similar to the following:

```
Autoconfigure set ON

FILENAME     CSR        VECTOR     BR_LEVEL     STATUS
           (octal)    (octal)

NAKAA      160000       000          0         CONNECTED
NAMSA      160002       000          0         CONNECTED
NARXA      172150       154          4         CONNECTED
NATKA      174500       260          4         CONNECTED
NAVVA      172000       300          4         CONNECTED
Unknown    160500       000          0         IGNORED
NAXQA      174440       120          5         CONNECTED
```

The `Unknown` (invalid device) message under the **FILENAME** heading indicates that a device is attached to the system but that a diagnostic test is not assigned to the device. Examine the diagnostic file names to find out which device is listed as unknown. Only the DHV11 of the current configuration does not display a diagnostic file name. The DHV is untestable, because it was assigned to a nonstandard CSR address.

NOTE: *A list of supported devices and their file names is given in the MDM Release Notes.*

3. Use the CONNECT command to assign the DHV11 diagnostic (NADHA) to the device at its current CSR address.

```
MDM>> CONNECT 160500 FILE_NAME NADHA VECTOR 320 BR_LEVEL 4
```

4. Use the SHOW BUS command again to make sure that the diagnostic is connected to the device.

   MDM displays a table similar to the following:

```
Autoconfigure set ON

FILENAME     CSR        VECTOR     BR_LEVEL     STATUS
           (octal)    (octal)

NAKAA      160000       000          0         CONNECTED
NAMSA      160002       000          0         CONNECTED
NARXA      172150       154          4         CONNECTED
NATKA      174500       260          4         CONNECTED
NAVVA      172000       300          4         CONNECTED
NADHA      160500       320          4         CONNECTED
NAXQA      174440       120          5         CONNECTED
```

   The presence of the diagnostic file name DHV11 and the connected status indicate that the device is testable.

5. Use the CONFIGURE command to load the diagnostic files.

A.3 Loading Individual Diagnostics

You can reduce diagnostic loading time by loading individual diagnostics. The following sequence of commands shows how to do this.

NOTE: *You must use the following commands before the system has been configured either through the CLM CONFIGURE command or through a menu-mode operation that has configured the system.*

1. Use the SHOW BUS command to view information about testable devices.

   ```
   MDM>> SHOW BUS
   ```

   MDM displays configuration information about the devices:

   ```
   Autoconfigure set ON

   FILENAME     CSR        VECTOR     BR_LEVEL     STATUS
                (octal)    (octal)

   NAKAA        160000       000          0        CONNECTED
   NAMSA        160002       000          0        CONNECTED
   NARXA        172150       154          4        CONNECTED
   NATKA        174500       260          4        CONNECTED
   NAVVA        172000       300          4        CONNECTED
   NADHA        160440       320          4        CONNECTED
   NAXQA        174440       120          5        CONNECTED
   ```

   The BUS display shows `Autoconfigure set ON` and all the diagnostics `CONNECTED`. These messages mean that diagnostics are loaded automatically when the system is configured.

2. Use the SET AUTOCONFIGURATION OFF command to reverse the status of the diagnostics.

   ```
   MDM>> SET AUTOCONFIGURATION OFF
   ```

Diagnostics are now ignored by MDM and listed as IGNORED, as in the following example. MDM does not load them when you configure the system.

```
MDM>> SHOW BUS

   Autoconfigure set OFF

   FILENAME     CSR       VECTOR     BR_LEVEL     STATUS
              (octal)     (octal)

   NAKAA    160000        000          0          IGNORED
   NAMSA    160002        000          0          IGNORED
   NARXA    172150        154          4          IGNORED
   NATKA    174500        260          4          IGNORED
   NAVVA    172000        300          4          IGNORED
   NADHA    160440        320          4          IGNORED
   NAXQA    174440        120          5          IGNORED
```

3. Use the CONNECT command to enable the diagnostic you want for loading.

```
MDM>> CONNECT 172000
```

The qualifier **172000** is the standard CSR address of the VSV21, the device you want to test. The diagnostic's file name is NAVVA.

4. Use the SHOW BUS command to confirm that the VSV21 diagnostic is connected and ready to be loaded.

```
MDM>> SHOW BUS

   Autoconfigure set OFF

   FILENAME     CSR       VECTOR     BR_LEVEL     STATUS
              (octal)     (octal)

    NAKAA     160000        000          0          IGNORED
    NAMSA     160002        000          0          IGNORED
    NARXA     172150        154          4          IGNORED
    NATKA     174500        260          4          IGNORED
    NAVVA     172000        300          4          CONNECTED
    NADHA     160440        320          4          IGNORED
    NAXQA     174440        120          5          IGNORED
```

5. Use the CONFIGURE command to load the VSV21 diagnostic:

```
MDM>> CONFIGURE
```

6. Use the SHOW CONFIGURATION BRIEF command to display enabled diagnostics.

```
MDM>> SHOW CONFIGURATION BRIEF
```

MDM displays the following:

```
1       NO Ld KAA    Disabled
2       NO Ld MSA    Disabled
3       NO Ld RXA    Disabled
4       NO Ld TKA    Disabled
5       VSV21A       Enabled Firmware id = 2
6       NO Ld DHA    Disabled
7       NO Ld XQA    Disabled
```

Only the VSV21 diagnostic is loaded and enabled for testing. All other devices display a "NO Ld" (no load) message.

7. Use the START command to start the diagnostic.

A.4 Preventing the Loading of Individual Diagnostics

You can reduce loading time by preventing MDM from loading individual diagnostics into the system. The following sequence of commands shows how to do this.

NOTE: *You must use the following commands before the system has been configured either through the CLM CONFIGURE command or through a menu-mode operation that has configured the system.*

1. Use the SET AUTOCONFIGURATION ON command to assign all diagnostics to devices configured at standard addresses.

```
MDM>> SET AUTOCONFIGURATION ON
```

2. Use the SHOW BUS command to find out which devices have been assigned a CONNECTED status.

```
MDM>> SHOW BUS
```

3. Use the IGNORE command to prevent MDM from loading the associated diagnostic.

```
MDM>> IGNORE csr_address
```

The variable *csr_address* is the address of the device whose diagnostic you want to prevent from being loaded.

4. Use the CONFIGURE command to load only connected diagnostics.

```
MDM>> CONFIGURE
```

A.5 Selecting Test Parameters

You can use CLM in two ways to select test parameters and run a diagnostic accordingly. The following two sections give example sequences of commands to do so.

A.5.1 Selecting Test Parameters: Method 1

The system configuration is as follows:

```
1      CPUA    Enabled KA630-AA 1MB, FPU MC=00 HW=00
2      MEMA    Enabled 2 megabytes. 4096 Pages.
3      RQDXA   Enabled Revisions =11 and 6
4      DEQNA   Enabled DEQNA AA-00-03-01-37-03
```

The default test and message parameters are as follows:

```
no device selected
Mode is SERVICE
Section is FUNCTIONAL
Number of passes is: 1
No time limit
Tests to be run:  ALL
Continue on error
Bell on error OFF
Detailed message is On
Progress message is Full
```

1. Use the DISABLE command to disable the MEMA, RQDXA, and DEQNA diagnostics.

```
MDM>> DISABLE 2
MDM>> DISABLE rqdxa
MDM>> DISABLE 4
```

   You have selected the CPU diagnostic to run by disabling all other available diagnostics.

2. Use the SET TEST command to select service mode tests 2 and 3.

```
MDM>> SET TEST 2,3
```

3. Use the SET PASSES command to direct that each test runs three times.

```
MDM>> SET PASSES 3
```

4. Use the START or SELECT command to start the diagnostics you want to test.

```
MDM>> START 1
MDM>> START 3
```

5. Use the SHOW DEFAULT command to display the new default test parameters.

```
MDM>> SHOW DEFAULT
```

   MDM displays the following:

```
   1     CPUA Enabled KA630-AA 1MB, FPU MC=00 HW=00
Mode is SERVICE
Section is FUNCTIONAL
Number of passes is: 3
No time limit
Tests to be run: 2 3
Continue on error
Bell on error OFF
Detailed message is On
Progress message is Full
```

6. Use the START ALL command to run all enabled diagnostics.

```
MDM>> START ALL
```

MDM runs only the CPU diagnostic, because you have disabled all others. MDM displays a progress message as it runs the tests:

```
CPUA started.
CPUA pass 1 test number 2 started.
CPUA pass 1 test number 3 started.
CPUA pass 2 test number 2 started.
CPUA pass 2 test number 3 started.
CPUA pass 3 test number 2 started.
CPUA pass 3 test number 3 started.
CPUA passed.
MDM>>
```

A.5.2 Selecting Test Parameters: Method 2

You want to select the DPV11A diagnostic to run.

1. Use the SELECT command to select the DPV11A diagnostic for testing.

```
MDM>> SELECT DPV11A
```

2. Use the ENABLE command to prepare the diagnostic to run.

```
MDM>> ENABLE
```

3. Use the SET SECTION EXERCISER command to run only the exerciser tests portion of the DPV11A diagnostic.

```
MDM>> SET SECTION EXERCISER
```

4. Use the SET PROGRESS FULL command to direct MDM to report the test number and pass number of the currently running diagnostic.

```
MDM>> SET PROGRESS FULL
```

5. Use the SET DETAILED_MESSAGES ON command to direct MDM to display detailed error messages.

```
MDM>> SET DETAILED_MESSAGES ON
```

6. Use the SET PASSES 10 command to direct MDM to run the exerciser tests 10 times.

```
MDM>> SET PASSES 10
```

7. Use the START command to begin diagnostic testing.

```
MDM>> START
```

MDM displays the following progress and error messages while the diagnostic is running. There are two available exerciser tests of the DPV11A, and MDM displays messages for each test.

```
  DPV11A started

DPV11A pass 1 test number 1 started.
DPV11A pass 1 test number 2 started.
DPV11A - Error Number 901      24-MAR-1989 09:44:29.26
Modem signals incorrectly looped back
DPV11 interface module (M8020)
DPV11A - Error Number 905      24-MAR-1989 09:44:29.28
CTS change failed to interrupt)
DPV11 interface module (M8020)
DPV11A - Error Number 906     24-MAR-1989 09:44:29.30
RI change failed to interrupt
DPV11 interface module (M8020)
DPV11A - Error Number 907     24-MAR-1989 09:44:29.32
DSR change failed to interrupt
DPV11 interface module (M8020)

DPV11A pass 2 test number 1 started.
DPV11A pass 2 test number 2 started.
DPV11A - Error Number 901      24-MAR-1989 09:45:29.27
Modem signals incorrectly looped back
DPV11 interface module (M8020)
DPV11A - Error Number 905      24-MAR-1989 09:45:29.29
CTS change failed to interrupt
DPV11 interface module (M8020)
DPV11A - Error Number 906     24-MAR-1989 09:45:29.31
RI change failed to interrupt
DPV11 interface module (M8020)
DPV11A - Error Number 907     24-MAR-1989 09:45:29.33
DSR change failed to interrupt
DPV11 interface module (M8020)

Ctrl/C

MDM Ctrl/C>>  HALT

DPV11A stopped

MDM>>
```

To show the first error message and the five most recent error messages, type:

```
MDM>> SHOW ERRORS

 First Error

DPV11A - Error Number 901      24-MAR-1989 09:44:29.26
Modem signals incorrectly looped back
DPV11 interface module (M8020)

Most recent errors (maximum of 5 displayed - total reported errors: 12)

DPV11A - Error Number 907     24-MAR-1989 09:45:29.33
DSR change failed to interrupt
DPV11 interface module (M8020)
DPV11A - Error Number 906     24-MAR-1989 09:45:29.31
RI change failed to interrupt
DPV11 interface module (M8020)
DPV11A - Error Number 905      24-MAR-1989 09:45:29.29
CTS change failed to interrupt
DPV11 interface module (M8020)
DPV11A - Error Number 901      24-MAR-1989 09:45:29.27
Modem signals incorrectly looped back
DPV11 interface module (M8020)
DPV11A - Error Number 907     24-MAR-1989 09:44:29.32
DSR change failed to interrupt
DPV11 interface module (M8020)
```

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Appendix B
Identifying Device-Level Problems

Any loss of system function may indicate a device-level problem—for example, intermittent failures or erratic system operation. DIGITAL suggests using the following MDM procedure for identifying device-level problems:

1. Boot MDM on the MicroVAX to be tested and enter Menu Mode.
2. Select Main Menu option 2, Display System Configuration and Devices. Check that all known devices are listed in the display.
3. If the System Configuration and Devices display is satisfactory, select Main Menu Option 1, Test the System.

   MDM runs all available verify-mode tests to locate errors and failing FRUs. If the system test identifies an FRU, replace or repair it.
4. If the problem continues or you want to perform more specialized testing, select Main Menu option 4, Display the Service Menu.

   Select Service Menu option 2, Exercise the System Continuously.

   MDM runs all functional tests and the service-mode exerciser test number 2 until you press Ctrl/C.
5. If the system fails the system exerciser test, but MDM does not identify a FRU, select the Device Menu.

   Select the suspected device and run its functional and exerciser tests.

   Run available utility tests of the device.
6. If you have not been able to identify the device-level problem, disable the suspected device and run the system exerciser test from the Service Menu. If failures no longer occur, then the suspected device is faulty.

NOTE: *MDM tests a system as defined when it was last configured. If you have placed a device on line or off line since then or have altered the device in any way, MDM may display incorrect error messages. Reconfigure the system to prevent this error: choose Main Menu option 2, Display System Configuration and Devices, and MDM reconfigures the system.*

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Appendix C
Copying Diskettes and Customizing Tapes

This appendix tells you how to duplicate kits from MDM diskettes and customize MDM tapes.

C.1 Duplicating Kits from MDM Diskettes

To duplicate MDM diskettes, use one of the following procedures appropriate for the installed operating system.

C.1.1 VMS

Before copying diskettes, use the VMS SHOW DEVICE command to find the device names of the two RX50 diskette drives. Type:

```
$  SHOW DEVICE DU
```

The system displays a list of DU-type devices, labeled as follows:

```
Device     Device     Error     Volume     Free     Trans Mnt
Name       Status     Count     Label      Blocks   Count Cnt
```

DU-type drives include all RD5n drives and each drive of an RX50. The highest numbered drives, such as drives DUA2 and DUA3, are typically assigned to the RX50.

To make a copy:

1. Place the first MDM diskette in the first diskette drive and a blank diskette in the second diskette drive.
2. Type:

   ```
   $  MOUNT/FOREIGN/OVER=ID DUAx
   ```

   The variable **x** is the number of the first diskette drive. The system displays the following message:

   ```
   %MOUNT-I-MOUNTED, ELAN              mounted on _DUAx:
   ```

3. Type:

```
$ MOUNT/FOREIGN DUAy
```

The variable y is the number of second diskette drive. The system displays the following messsage:

```
%MOUNT-I-MOUNTED,                    mounted on _DUAy:
```

4. Type:

```
$ BACKUP/PHYSICAL/VERIFY/INIT DUAx: DUAy:
```

The system displays the following message and copies the contents of DUAx onto DUAy:

```
%BACKUP-I-STARTVERIFY, starting verification pass
```

Once the system has copied the contents of the diskette, it displays the system prompt.

5. Type:

```
$ DISMOUNT DUAx  (where x = first diskette drive number)
$ DISMOUNT DUAy  (where y = second diskette drive number)
```

Repeat this process for each MDM diskette.

C.1.2 ULTRIX–32M

Use the following command to copy MDM diskettes using ULTRIX–32m:

```
DD IF=/DEV/RA1A OF=/DEV/RA2A
```

The variables **DEV/RA1A** and **DEV/RA2A** are the logical names of the input and output diskette, where the system has only one RD5n disk drive labeled DEV/RA0A. If the system has two RD5n drives, the two diskette drives are labeled DEV/RA2 and DEV/RA3A.

NOTE: *This procedure generates one error as the system tries to read past the end of the input disk. Nevertheless, all the data is copied successfully.*

C.2 Customizing MDM Tapes

It is possible to make a tape that contains only necessary diagnostics. MDM maintenance tape kits include a VMS utility program, CUSTOM.COM, that customizes tapes. This utility is part of MDM bootable kits distributed on TK media.

The data file CUSTOM.DAT contains a list of all the diagnostics provided on the MDM TK maintenance media. Copy this file into a directory containing no other files. Edit the data file to contain only the diagnostics you want the new tape to contain.

Once you have created the data file, use the CUSTOM utility to copy the selected files.

NOTE: *You must run this utility from the directory in which the new data file resides.*

1. Type the following VMS commands to copy all the selected files from the TK media to the VMS system.

```
VMS> set def disk$user:[tape.custom]
VMS> alloc MUAx:       (x = unit drive number)
VMS> mount MUAx:  ELAN
VMS> copy MUAx:[SYS0.SYSEXE]*.* []
VMS> dismount MUAx:
VMS> dealloc MUAx:
```

2. Insert the TK media that will contain the customized version into the tape drive.

3. Use CUSTOM.COM to activate the utility program by typing the following indirect command at the VMS prompt:

```
$ @CUSTOM
```

4. The utility prompts for the device name of the drive, the name of the data file that contains a list of the diagnostic programs to be loaded, and the location of the files. Supply all information.

The utility copies the requested files onto the tape and displays a progress message as it does and a success message once it has completed the task, for example:

```
Copied SYSBOOT.EXE to MUA0:[SYS0.SYSEXE]SYSBOOT.EXE
Copied NARRA.EXE to MUA0:[SYS0.SYSEXE]NARRA.EXE
Copied NAXQA.EXE to MUA0:[SYS0.SYSEXE]NAXQA.EXE
Copied NAMSA.EXE to MUA0:[SYS0.SYSEXE]NAMSA.EXE
Copied NATKA.EXE to MUA0:[SYS0.SYSEXE]NATKA.EXE

Rewinding and dismounting tape . . .

      +-------------------------------------------------+
      +                                                 +
      +                                                 +
      +                                                 +
      +      You have successfully built your media.    +
      +                                                 +
      +                                                 +
      +-------------------------------------------------+

CUSTOM> Do you want to build another kit [N] ?  n
```

You may type QUIT at any time to exit from the utility.

Appendix D
MDM Kernel Messages

MDM typically displays kernel messages before it fails because of severe software or hardware problems, as in the following example:

```
!!!!!!-- SYSTEM HALTED - FATAL ERROR - INI  --!!!!!!
!!!!!!--          0007C0C                  --!!!!!!
```

MDM kernel message consist of two lines, as follows:

- Line 1 contains
  - A description of the event, for example `SYSTEM HALTED`
  - The MDM phase or process that generated it, for example `INI`
- Line 2 consists of a hexadecimal value, for example, `007C0C`

  The equivalent of this number is `Bad job or process creation`

You use Table D–1 to look up each number's meaning. Numbers are listed in ascending order.

Table D–1: Kernel Messages

Number	Message
00000001	Normal successful completion
00007C04	Bad parameter count
00007C0C	Bad job or process creation
00007C14	Bad string parameter length
00007C1C	Bad access mode
00007C24	Bad stack
00007C2C	Bad object state
00007C34	Bad object type
00007C3C	Bad parameter value

Table D–1 (Cont.): Kernel Messages

Number	Message
00007C44	Connect circuit completed
00007C4C	Connect circuit pending
00007C54	Connect circuit timeout
00007C5C	Count overflow
00007C64	Count underflow
00007C6C	Debug signal
00007C74	Already connected
00007C7C	Circuit disconnected by partner
00007C84	Duplicate name
00007C8C	Kernel stack not valid
00007C94	Machine check
00007C9C	No access to parameter
00007CA4	No destination port
00007CAC	No job initialization specified
00007CA4	Physical memory available
00007CBC	No I/O mapping register available
00007CC4	No message available
00007CCC	No object table entry available
00007CD4	No process page table available
00007CDC	No datapath register available
00007CE4	No pool available
00007CEC	No port available
00007CF4	No exit status value specified
00007CFC	No such device
00007D04	No such name
00007D0C	No such port
00007D14	No such program

Table D–1 (Cont.): Kernel Messages

Number	Message
00007D1C	No such service
00007D24	No system page table entries available
00007D2C	No virtual address space available
00007D34	Power recovery signal
00007D3C	Quit signal
00007D44	Remote port value
00007D4C	Process exit signal
00007D54	Remote system currently unreachable
00007D5C	Signal
00007D64	Remote system rejected username or password
00007D6C	Bad message size
00007D74	Referenced sharable image not present
00007D7C	Unsupported program image format
00007D84	Internal consistency failure
00007F01	Time has not been previously set
00007F09	Expedited message
00007F11	Previous job actually created area

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